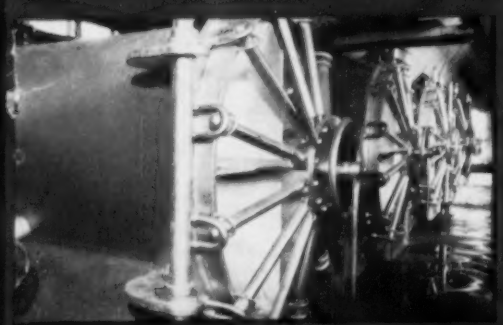
OCTOBER 1955
35 CENTS

FOOD ENGINEERING

A McGRAW-HILL PUBLICATION

PACKAGING • Big savings achieved with electronic bacon-slicer control. p. 94

INGREDIENTS • Versatile algin has wide application as quality improver. p. 87



PROCESSING • Pushbutton filtering cuts downtime and saves much labor. p. 59

ENGINEERING • Russian food engineers have created unique plants and processes, such as circular-line, round bakery. p. 66

ALSO: SANITATION • MAINTENANCE • PERSONNEL
MATERIALS HANDLING • PRODUCTS • QUALITY CONTROL
INSTRUMENTS • TRANSPORTATION

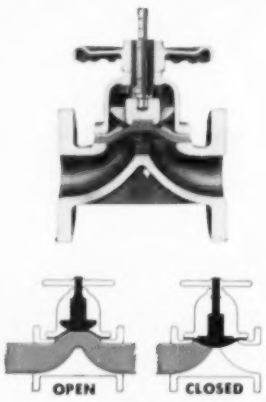
. . . See Contents Classified by Subject, Page 3

INQUIRY COUPON INSIDE BACK COVER

GRINNELL-SAUNDERS DIAPHRAGM VALVES

In hundreds of installations, the maintenance-saving design of Grinnell-Saunders Diaphragm Valves has accounted for important economies of labor and money. The only part that will in time need replacement is the diaphragm, and depending on the type of service, it may last for years. To replace it takes only a few minutes. You merely remove the four bolts holding the bonnet, leaving the body in the pipe line . . remove the worn diaphragm, insert the new diaphragm . . replace the bonnet and bolt it down. No refacing or reseating required . . no packing glands to demand attention.

Originally perfected for air and water service, Grinnell-Saunders Diaphragm Valves are now widely specified for many other applications. They greatly reduce replacement and maintenance expenses, especially in lines where corrosion, abrasion, contamination, clogging and leakage can be costly factors. Write today for the Grinnell-Saunders Diaphragm Valve Catalog . . and assign your next valve problem to Grinnell.



Other Important Features:

Diaphragm absolutely isolates working parts from the fluid stream

Diaphragm lifts high for full, streamline flow in either direction

Diaphragm presses tight for positive closure

Body, lining and diaphragm materials to suit service

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island — Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

OCTOBER 1955

Volume 27 Number 10

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To Which Articles Apply

Baking	Beverages	Cereals	Confectionery	Dairy	Fruits, Vegetables	Meats, Fish	Other Foods
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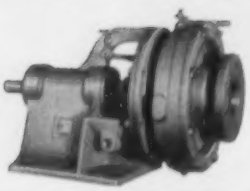
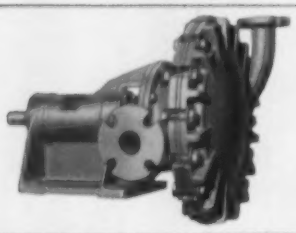
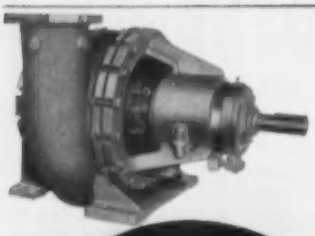
Easy To Find the PUMP You Need

		APPLICATION	TYPE	SIZE RANGE	SPECIAL FEATURES
	Frame Mounted: Bulletins 52B6351, 52B6105 Close Coupled: Bulletins 52B6083, 52B6140	General purpose use.	**SSB** Single Suction, Frame Mounted, Grease Lubricated. Also available close coupled.	Heads to 550 feet. Capacities to 3500 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing, single or double mechanical seal.
	Bulletin 52B7638	Chemical and general purpose use in medium high temperature range.	**SSB** Single Suction, Frame Mounted, Oil Lubricated.	Heads to 250 feet. Capacities to 3500 gpm. Temperatures to 550 F.	Available in many materials. Choice of packing, single or double mechanical seal. Stuffing box cooled above 250 F. Bearings protected from corrosive or abrasive laden atmosphere.
	Bulletin 52B6615	Handling fine abrasives in suspension or corrosive liquids.	**P and PD** Single Suction, Frame Mounted, Grease Lubricated.	Heads to 260 feet. Capacities to 1300 gpm. Temperatures to 250 F.	Stuffing box on suction side. Choose packing, mechanical seal or *Equiseal* stuffing box—stops leakage to 15 feet suction head. Open or closed impeller.
	Bulletin 52B7112	Handling fine and coarse abrasives in suspension or corrosive liquids. For larger rating than PD pumps.	**PW** Single Suction, Foot Mounted, Oil Lubricated.	Heads to 260 feet. Capacities to 10,000 gpm. Temperatures to 250 F.	Available in extra-hard materials. Has thick metal sections to withstand abrasion. Easy to disassemble for inspection and cleaning. Open or closed impeller.

complete pumping unit with undivided responsibility

Here's what you can get from Allis-Chalmers: complete pumping unit—pump, drive, motor and control—ready to install and run. You save installation time. All parts are of coordinated design . . . built to run together. You get one dependable guarantee of satisfaction for complete installation.

Your nearby Allis-Chalmers District Office representative will be glad to help you with your process pumping problems. Or for complete information on Allis-Chalmers pumps for the food industry, write for the bulletins indicated in the table above. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4572

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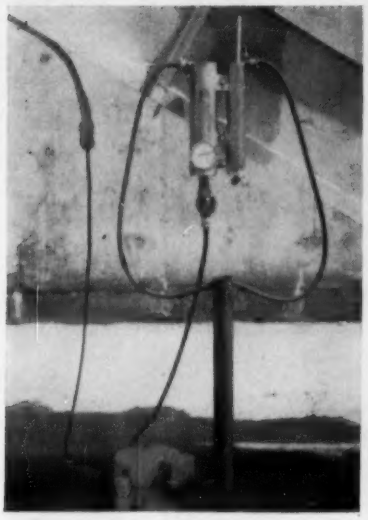
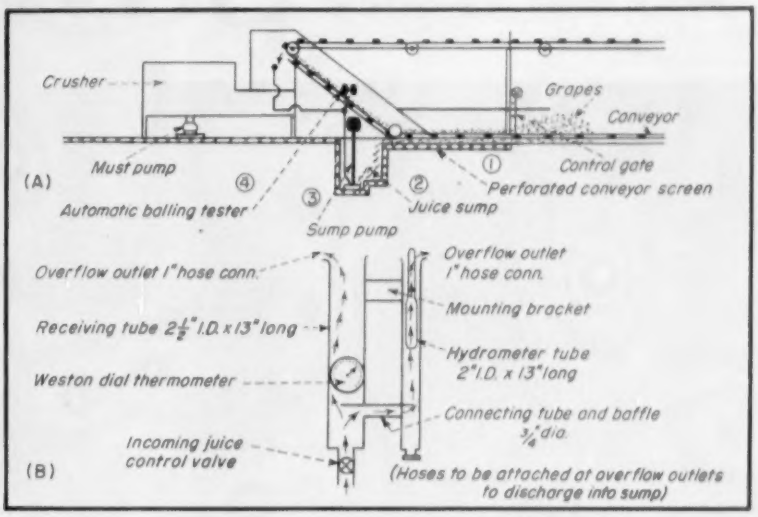
ALLIS-CHALMERS

PRACTICAL IDEAS





Grape Juice Sampling Device

At the winery our raw material—grape juice—is bought on the basis of Balling degree. Considered as somewhat unsatisfactory by both wine-makers and growers, the conventional method of sampling a truck-load of grapes is by "tube thief" or hand selection. This sample is then manually crushed—sometimes crushed by small machine—and Balling degree of the juice becomes the basic, if not the only factor of computing grower payment, raw material cost.

During the 1954 vintage we devised and installed this automatic Balling testing unit with the following results:

1. Reading is continuous, provides a truly representative test, and indicates any variation in a load.
2. Observing and recording sugar degree by the crusher operator is simple and fast.
3. Dependable results—no psychological influence to mar accuracy.
4. Better control—crusher operator may divert grapes to another observing point if necessary.
5. Unit invites further development of other devices and equipment to record percent sugar, as well as incorporating other instruments for additional physical or chemical tests.

Juice is crushed from grapes through a perforated screen (1) mounted in the bottom of crusher conveyor. Grapes are forced through screen by weight of the load, and pressure of forced travel against flow-regulating gate. Juice drops through the screen into a flume leading to a small sump (2) in which a pump (3) is located. This pump, equipped with a bypass and regulating valve, supplies juice to testing unit (4) with oversupply joining main juice flow from the crusher.

Device is rather simple and can be fabricated of copper or stainless tubing in the winery shop. It is comprised of one 2½-in. ID tube in which a dial thermometer is installed and this is connected by a ¾-in. ID pipe to the 2-in. ID tube in which the hydrometer is placed. Juice is pumped into the larger receiving tube, flows through the ¾ in. connecting pipe to the hydrometer tube, then is discharged from tops of both of the larger tubes. If preferred, it may be piped from these discharge points, or permitted to spill from tube lips into a funnel, thence to juice sump. Flow volume through the tubes is controlled by a hand-operated valve, mounted at the bottom of the receiving tube.

Temperature and Balling degree of juice may be read simultaneously by crusher operator who then enters this data by designated loads.

Pump used to supply this unit must have sufficient capacity to rapidly draw juice from the sump. By clearing the sump quickly, new truckloads of grapes may be dumped onto conveyor, within very short time. Thus, operator is able to distinguish between loads for his readings and recording. Sufficient juice must be allowed to flow through tubes for proper readings.

Installation of an automatic unit in any process always suggests the possibility of improvement and change. A survey of immediately available instruments and equipment of other types, to either indicate and/or record percent of sugar present in grape juice, showed there are a variety of these which could be employed to improve this unit.

With a recording type instrument, the recording—made at any one instant could be easily identified with its grape load directly on the chart. Such records would become a valuable source of information to accounting as well as production departments.—*Max Goldman, Waterford Winery, Ltd., Waterford, California.*

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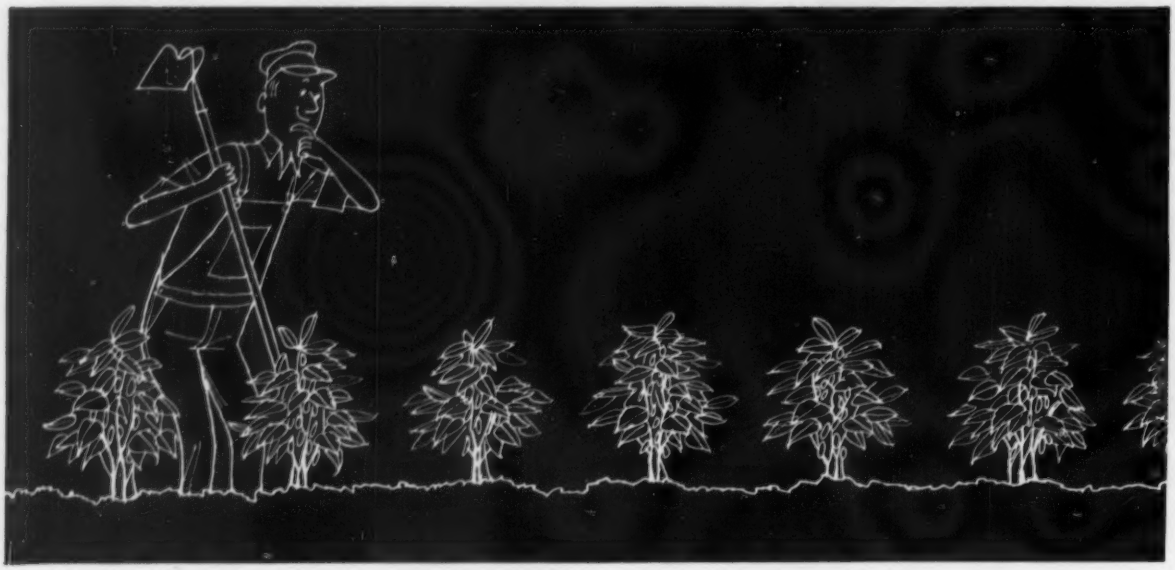
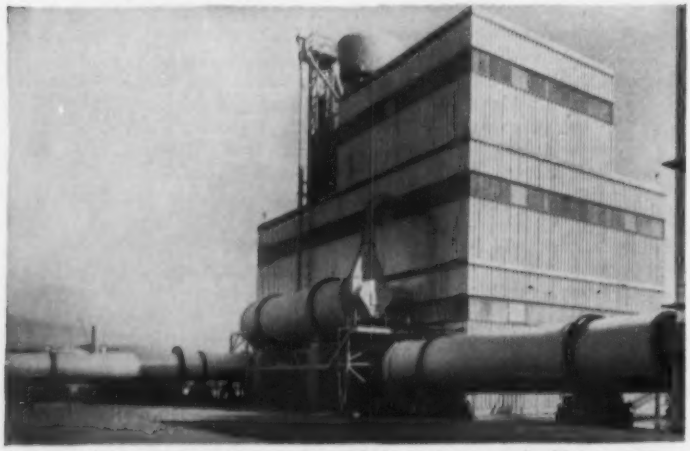
when it comes to processing Soybeans



CENTRAL SOYA goes to Louisville equipment



Louisville Dryer operation at Central Soya Company's Chattanooga, Tennessee soybean processing plant

More efficient drying and heating of cracked soybeans before flaking . . . faster cooling of exhausted flakes . . .

Louisville coolers and dryers provide these benefits for Central Soya Company at their soybean processing plant in Chattanooga, Tennessee.

Stepped-up production schedules (with lower costs) are easily achieved with Louisville dryers and coolers because each piece is "job-fitted." When advisable, pilot plant tests determine the design best suited and show probable results *before* you order.

For lower cost drying . . . get the facts about the Louisville method.

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN

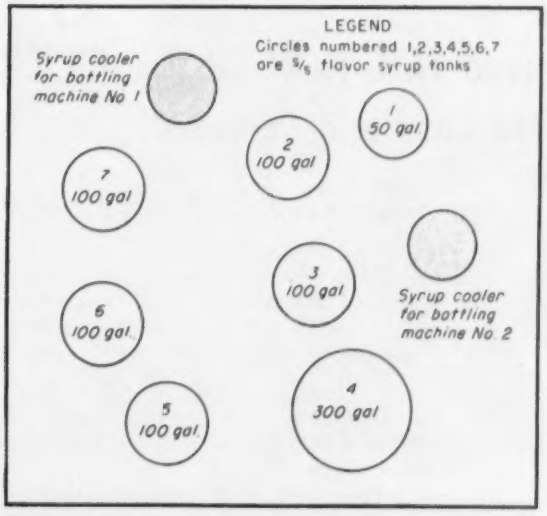
Louisville Drying Machinery Unit
GENERAL AMERICAN TRANSPORTATION CORPORATION
Dryer Sales Offices: 139 South Fourth Street · Louisville 2, Kentucky
General Offices: 135 South La Salle Street · Chicago 90, Illinois

Carton Traffic Cop

To time the transfer of potato chip cartons from an inclined gravity conveyor to a flight-type belt feeding the automatic wrapper, a novel control device has been installed in our Atlanta, Ga., plant.

A vertical metal finger at the end of the gravity conveyor (see photo) stops each carton. Then a lever mechanism lowers this stop at the right second to permit the carton to drop between flights on the wrapper feed conveyor.

The stopping-finger is lowered against a spring by a pivoted arm made of angle iron. And this arm is actuated by a wheel attached to one end when one of the flights on the belt conveyor passes under the wheel, raising it momentarily.—*W. E. Freeman, V.-P. of Production, H. W. Lay & Co., Inc., Atlanta, Ga.*

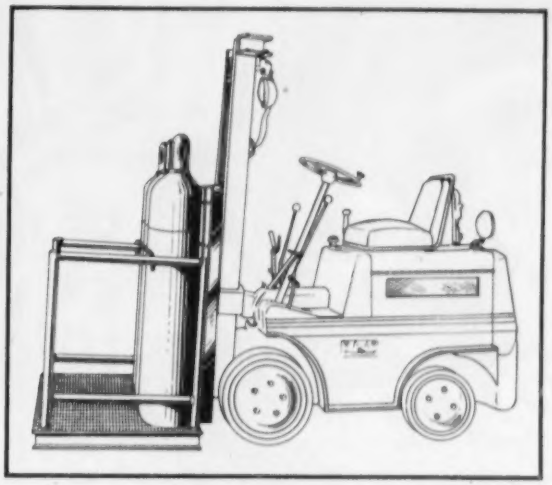

LEGEND
Circles numbered 1,2,3,4,5,6,7 are 5/8 flavor syrup tanks
Syrup cooler for bottling machine No 1
1 50 gal
2 100 gal
7 100 gal
3 100 gal
Syrup cooler for bottling machine No. 2
6 100 gal
5 100 gal
4 300 gal

Speeds Flavor Changeover

To facilitate bottling operations and especially the feeding of flavor syrup to two bottling lines on the ground floor of our plant, we have devised a system of semimobile stainless steel flavor tanks and flexible Tygon feed tubing. With this, it is possible to use any one of seven flavor tanks to feed either one of the bottling machines used in our plant.

The increased flexibility and adaptability that we gained from this system allows us a much greater freedom in flavor sequence in bottling operations. In addition, time required for make-up and standby has been reduced. Also possible, is elimination of four flavor tanks, resulting in more elbow room and more space for storage of "in use" flavors, colors, and fruit acids in our flavor lab.

All in all our housekeeping has been lightened and the general efficiency of our flavor lab operations have been increased at least 50%. General working conditions have been improved and more time is available now for flavor development and improvement work, which in the past was consistently interrupted by day to day production demands.—*Robert M. Sandri, Laboratory Manager, Brookdale Beverage Co., Bloomfield, N. J.*



Cylinder Rack and Pallet Platform

Here's a device which can be used for the safe storage of compressed gas cylinders, or it may be used to transport the cylinders from storage areas to work areas. Made of sheet steel and tubing, this hand rail protected pallet (see sketch) may also be used to provide a safe working platform for maintenance men working at elevated levels. —*National Safety Council, Chicago (Monsanto Chemical Co. contribution).*

Way to Cure Drier Infestation

Unquestionably among the more serious insect harbingers and, therefore, avenues of contamination in a macaroni plant, are the continuous driers. Conditions in these driers are ideal for stored product pest or "weevil" development.

Here are the reasons:

1. Heat and moisture conditions are ideal to promote insect activity and rapid breeding.
2. Driers often have hidden ledges, cracks and crevices where food dust accumulates and serves as insect breeding media.
3. Such equipment is largely inaccessible for thorough cleaning to remove these hidden food dust accumulations.

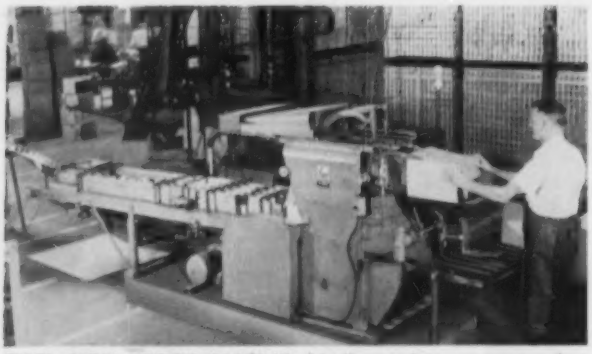
If residual insecticides are applied, they seldom reach the hidden infestations. The same is primarily true with contact or space sprays. Spot fumigation of a continuous macaroni drier is exceedingly costly because of leaking of fumigant and hence the large amount of fumigant that would be required to maintain a lethal dosage for the necessary 4 to 8 hours.

The problem, however, is not insurmountable since the macaroni continuous automatic drier has available in itself the very best method of insect control—this is heat.

Stored product pests such as Confused Flour Beetles, Saw-Toothed Grain Beetles, etc. are killed if exposed to

DOES YOUR PACK SUFFER *Bowling Ball Impact?*

Time to replace with a New Improved FMC NON-SHOCK CASER —so *Smooth and Gentle* to Cans and Contents



FMC's NON-SHOCK CASER "babies" cans into cases at a fast clip, limited only by the speed of the operator.

—even at speeds up to 1200 cases per hour!

Old methods of casing no longer meet the requirements of spoilage-free, high-speed operations—especially where loosening can seams of high-vacuum packs is a problem. The new Model 3 FMC Non-Shock Caser, with all its exclusive features for big capacity and gentle handling, really "delivers the goods" to the case completely free of damaging impact to cans, labels or product. Compact and flexible, machines are built to handle specific can sizes and certain combinations from 202 x 308 packed 6 x 8, to 603 x 700 packed 2 x 3.

Remember: There are extra dividends when you care for your cans all the way to the case – with an FMC *Non-Shock* Caser!

NO ROLLING – NO NEAR SEAM IMPACT
Cans enter the machine *upright*, move smoothly along woven wire belt, are transferred gently to the case.

NO CAN ELEVATOR REQUIRED
Cans are delivered to the continuous feed belt through a 90° twister, avoiding the seam-splitting action of steep gravity-roll contact.

FREE BULLETIN AVAILABLE
Fully illustrated Non-Shock Caser bulletin is yours for the asking. Better yet, call your FMC representative today for complete information!

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

Key to food equipment

minimum temperatures of 130 deg. for approximately 8 hours. Temperatures of 140-150 deg. will kill a little quicker —in about 4–6 hours. Even temperatures as low as 125 deg., if held for 16 hours, can be expected to effect perhaps an 80–90% kill of typical "weevils."

Most macaroni plants do not, of course, operate their driers much above 110%, and so when this thought of heat sterilization in their driers is broached they are dubious as to whether their particular drier will reach these temperatures. Rest assured that temperatures at a minimum of 130 deg. can be reached by almost all such driers and have proved the best method of insect control available, even including insecticide fumigants, etc. Imagine the desirability of this change if heat sterilization will effect a 90% kill as against insecticidal or fumigating action of only 40–50% kill.

The technique of heat sterilization in driers is not difficult. It need be practiced only once every two–four weeks. There seems to be no particular hazard involved other than possible damage to the instruments, which must be protected from the heat in the drier either by removing them during the heat sterilization or protecting the panels with cardboard or non-heat conducting materials.

The macaroni plant usually need only obtain a few thermometers that will reach these required temperatures and place them at the ends of the drier so that they can be seen through the glass panel to observe when the proper temperatures are reached. Once they are, and if the heat is constant—in other words, if it is not leaking—then good insect kill can be effected. If the drier is leaking and the heat is not maintained it is usually a simple matter to seal the unit.—*T. L. Hugé, The Hugé Co. and American Sanitation Institute, St. Louis, Mo.*

Ends Capping Failures

Any frequent appearance of uncapped bottles at Mission Bottling Co., Fort Worth, Texas, has been eliminated by a combination of devices developed by G. H. Witt, Production Supervisor.

Corrective means was developed to provide an automatic stop which would shut off the production line whenever a crown was missing in the stream feeding into the capper. First, it was necessary to devise a practical method of detecting absence of a crown, and then install mechanism which, when actuated, would shut off the entire line and thus prevent backing-up.

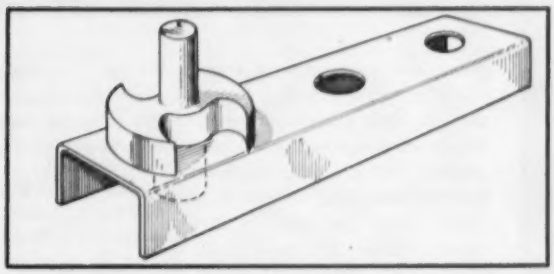
Unit which detects missing caps at the station location on the capper is a small rubber-tired wheel (arrow in photo). This tiny wheel fits into a groove in the capper at crown level and is revolved by the machine as it turns on its axis.

Positioned on the end of a pivoted arm, the spring-actuated small wheel is held against crowns and the smooth rim between crown slots unless a crown is missing. Then the spring forces the wheel into the crown slot at the same time releasing a pawl to operate an air valve to stop the operation of the machine and line.

After a crown has been placed in the empty slot the machine can then be restarted by hand-setting the detecting-control mechanism—*Robert Latimer, Denver, Colo.*

Cost of Waste Pointed Out

Waste reduction posters (see above) have been placed in strategic spots throughout all Green Giant Co.'s plants to graphically and forcefully bring to light the cost of waste. A reproduction of the poster apeared in the company's employee publication, "Nibletter" with this comment "Don't take the money out of your own pocket. Remember the Green Giant retirement trust and the profit-sharing bonus are based on the profits of our company. Waste cuts these profits to bits. A year-round necessity, waste reduction takes on special emphasis in Green Giant land during pack. Do your part to help cut costs and keep the profit line black."



Protects Pump During Cleaning

Here is an easily made form for holding the impeller of a Waukasha sanitary pump during the cleaning operation.

An aluminum channel, 10x2x1 in. (see sketch) is the material from which the holder is fabricated. The length of the form will depend on whether it is designed to hold one impeller or several.

Now, with an arbor-hole saw or other available means, cut a circular opening in the wide, top surface of the

SODIUM BENZOATE REPORT:

Spoiled margarine loses customers, costs you money...insurance is cheap

Make *sure* your products won't spoil by using safe Sodium Benzoate—the only *completely* dependable insurance you can buy. Sodium Benzoate keeps products fresh by controlling the growth of yeast, mold and bacteria that cause spoilage. It's low-cost insurance, too! Only a fraction of one per cent in margarine gives your product *months* of freshness.

Refrigeration and quick delivery of perishables are important, too. But insist on Sodium Benzoate, then you're *really* sure!

Organic Chemicals Division
MONSANTO CHEMICAL COMPANY
Box 478-Y-7, St. Louis 1, Missouri

MONSANTO

SERVING INDUSTRY . . . WHICH SERVES MANKIND

46¢ PROTECTS 1000 LBS. One pound of Sodium Benzoate costs only 46¢* yet it's enough to protect 1000 lbs. of margarine! Because most food products require only 0.1% sodium benzoate to insure freshness, this effective preservative is the cheapest insurance on the market!

**Subject to change without notice.*

channel to accommodate the large end of the impeller. The fit should be snug.

This support device keeps impellers from rolling or from making contact with floor or other sources of abrasion. Impellers are safe on the stands since the softer metal of the holder will not scratch or mar.—*Thomas B. Mason, Chief Engineer, Central Dairy Products Co., Oklahoma City, Okla.*

Avoid Ladder Hazards

For thousands of years men have been using ladders. In fact it is as natural to use a ladder as it is to use a knife and fork. So we take ladders for granted, give little thought when climbing or working from them—and pay the penalty in injury and death.

According to reports received by the Department of Industrial Relations, Division of Industrial Safety, State of California in 1951, nine workers were killed and almost 4,000 workers disabled from ladder accidents in industry alone. No doubt there were thousands of other ladder injuries not reported.

Here are suggestions from California's safety division that any food manufacturer anywhere can profitably apply to reduce the hazard of injury from ladders.

Ladder accidents are usually caused by two things—either the use of unsafe ladders or the unsafe use of safe ladders. By applying three common sense precautions, practically all ladder accidents and injuries can be avoided. First, select the right ladder for the job; second, check the condition of the ladder, and third use the ladder safely.

In selecting the right ladder for the job, do not use a ladder that is too long or too short. Never use two ladders spliced together and be sure not to use a light household ladder for a heavy construction job. Finally, don't ever use metal ladders near electrical circuits or power lines.

After selecting the right type of ladder check it carefully before using for cracks or split side rails, for missing, broken, or otherwise defective steps, cleats, rungs, treads or U-shapes. Also check the ladder for sharp edges and splinters on cleats, rungs, and side-rails. And finally, check it for general weakened conditions.

If it is found to be unsafe, withdraw it from use and fix it at once if possible. If it cannot be repaired don't lay it aside, but *destroy it immediately to make sure it will never be used again.*

Though the right ladder is selected for the job and checked before use, it may still be dangerous unless it is used safely. The most commonly used ladder is the portable straight ladder which requires great precaution in using.

Place ladder in position with care. If the foot is too close to the wall the ladder may fall backward. If it is placed too far from the wall the ladder is more likely to slip. Set the ladder at an angle of 70 deg. with the floor or ground. The horizontal distance from the wall to the foot of the ladder should never be more than ¼ the length of the ladder.

Make sure the ladder is not placed on a loose object or on uneven footing. To prevent slipping equip the ladder with non-slip points or safety shoes if practical. If not, secure the ladder firmly by lashing it with rope, or by other means.

Never lean a ladder against a movable object, and don't lean a ladder against window sashes. Instead securely fasten a board (see sketch) across the top of the ladder to give a bearing on each side of the window.

It is essential to protect the man on the ladder. See that a helper stands guard in dangerous circumstances, especially when a ladder is in front of a door. If there is danger of a vehicle or person bumping into the ladder, rope off a space around the ladder if no helper is available.

Always remember that the ordinary straight ladder is not built to support more than one person, and that a person should always face the ladder and grasp the side rails or rungs with both hands when going up or down.

Don't hurry. Take one step at a time and avoid carrying tools. This can be done by putting them in a sack that hangs from a strap over the shoulder or using a bucket and rope to haul or lower them.

Remove any oil or grease from the soles of shoes before using a ladder. This may save a serious fall.

Never work above the second rung, from the top of a straight ladder. When working away from a ladder, hold on with one hand. Don't over-reach and don't push or pull if it will cause the ladder to move. When it is necessary

CAN YOU USE $50?

Then here's an opportunity to get it.

Send one of your ideas to FOOD ENGINEERING.

Each month $50 is presented to someone like you for the best item in this department. And the chance that it will be you is now running about one in twelve.

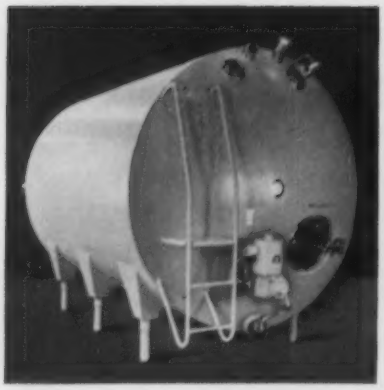
Also $5 to $15 is paid for each contributed item used. So a few minutes time may net you as high as $65.

Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

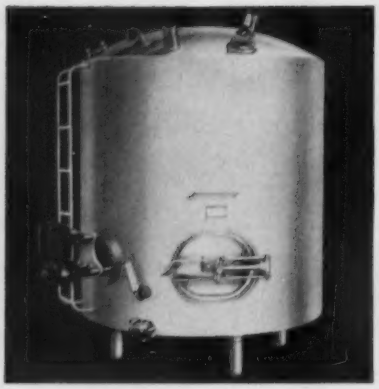
We'll do the finished writing and drawing for you.

Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors.

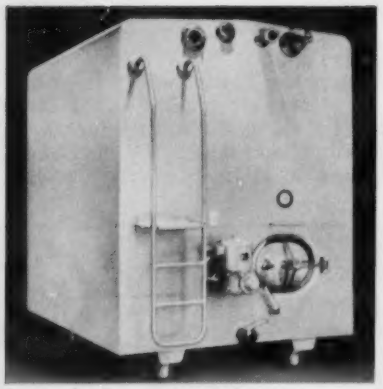
AUGUST PRACTICAL IDEA WINNER was "Cools Without Refrigeration," submitted by R. Stanley Field, Sherry Anne Candy Co., Philadelphia.



Cherry-Burrell horizontal insulated tanks for maintaining product temperatures; or with channel wall surface for preheating or precooling to reduce peak demand loads. Air or mechanical agitation. Standard capacities to 10,000 gallons. Special sizes available. Bulletin G-496.



Cherry-Burrell vertical insulated tanks for maintaining product temperatures; for preheating or precooling to reduce peak processing loads. All types of agitation. Save floor space. Standard capacities to 3,000 gallons. Special sizes available. Bulletin G-496.



Cherry-Burrell rectangular (super space-saver) insulated tanks for holding, heating and cooling. Can be arranged in banks for complete utilization of floor space. Standard capacities to 5,000 gallons. Specials upon request. Bulletin G-481.

All 6 look like storage tanks . . . BUT . . .

These Cherry-Burrell Stainless Steel Tanks are far more than mere storage tanks. They can be process vessels for handling a wide variety of liquids and semi-liquids . . . *in a wide variety of ways.* Ideal where sanitation and/or corrosion resistance is important.

For example, you can use them to provide "surge" for heating and cooling operations in continuous processing systems . . . to blend and preheat . . . to formulate and hold . . . to mix, heat or cool.

However you use them . . . or wherever . . . Cherry-Burrell Stainless Steel tanks can save you time and labor through controlled "in-tank" processing during off hours.

Full range of sizes (from 60 to 10,000 gallons), shapes and types available for early delivery. Ask your Cherry-Burrell Representative for details. Or write for literature.

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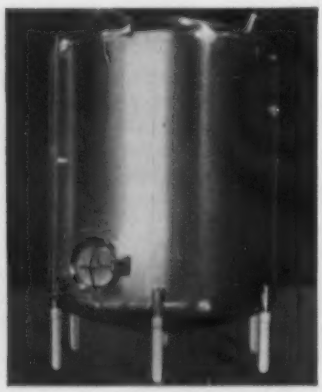
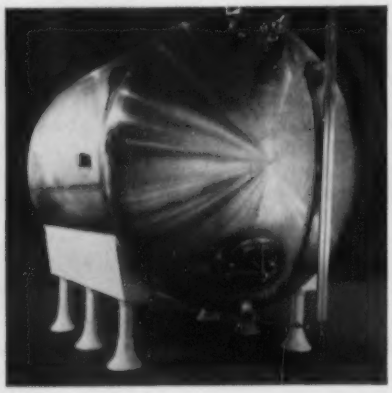
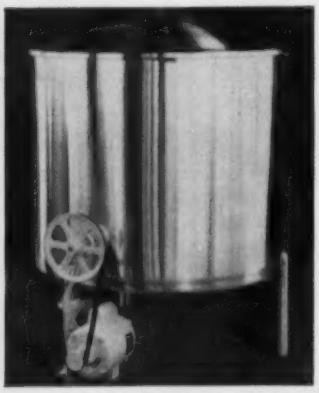


Cherry-Burrell single-shell vertical tanks. For holding, mixing or blending of one or more products. Available with or without agitation. Uninsulated. Standard capacities to 3,500 gallons. Special sizes available. Bulletin G-506.



Cherry-Burrell horizontal single-shell tanks for holding, mixing or blending liquid products such as syrups, liquid sugars, corn syrups. With or without agitation. Uninsulated. Standard capacities to 5,000 gallons. Special sizes available. Bulletin G-506.



Cherry-Burrell open-top single-shell tanks for "surge" storage, side or bottom mixing. "Reverse dish" bottom. Standard capacities from 60 to 500 gallons. Special sizes available. Bulletin G-502.

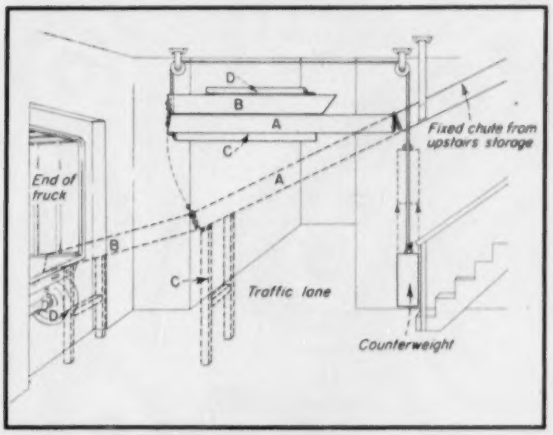
to reach for something far away, take time to move the ladder closer. *You reach for an accident when you overreach.*

It is a mistake to attempt to straddle the space between a ladder and another object, and don't ever work on a ladder in a high wind.

When using step-ladders try not to use any over ten feet long. And under no circumstances use a step-ladder that is more than 20 feet long. Unless the step-ladder has a guard rail, do not stand on the top step. Limit yourself to working from a step second or third from the top.

Open the step-ladder all the way and lock the spreaders, but don't use ladders with rope or chain spreaders.

Finally, never use a step-ladder as a straight ladder, that is, by leaning the top against a wall or other support.

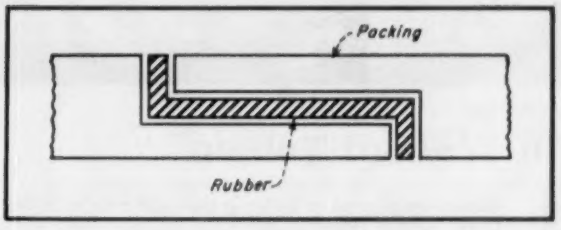


Folding Chute Clears Aisle

When goods stored in upstairs areas must be truck-loaded across busy aisles, this chute will do the job—then fold up—and leave corridors free for normal traffic.

A counter-weight balances the whole unit. Chute sections and legs are hinged. Section (B) unfolds after section (A) is pulled down, then legs (C) and (D) flip into place.

Unit could also be composed of roller or skate track, with snubbers installed to decrease case speed.—*FE Staff*



Hermetic Retort Door Packings

We tried several ways to make a perfectly tight closure on retort doors in order to cut down steam losses during retorting, and to avoid escape of air during pressure cooling.

Finally, we tried rubber vulcanizing patches (the kind almost everybody has in his car for tube repairs), and put them between the step-cut hydraulic packing joints (see sketch).

We found that when a retort door was closed, pressure and heat of the steam vulcanized the rubber, sealing the joint and giving a perfect hermetic closing. In preparation, rubber patch should be soaked for a minute or so in gasoline to make it softer and obtain only a thin layer of rubber between the overlapping joints.

This procedure can be used to join packings in any place where pressure and heat can be applied.—*Endre Csorgey, Assistant Manager, Compania Presquera de Coishco, Chimbote, Peru.*

Simple Bean Cleaning Device

We use a special machine for removing field dust from beans being readied for packing in cellophane.

The unit consists of a medium mesh screen mounted on an incline base (see top photo). A ½ hp. motor drives eccentric bearings and shaft to shake the screen.

Beans poured in at the higher end of the screen (see photo above) gradually are shaken to the lower end and drop off into a tank over the packaging machine.

Dust and dirt lumps are broken by the vibration and fall through the screen into a trough, from which the discarded material is gradually vibrated into a box beneath the unit.

Complete machine may be dissembled in about 5 min. for complete clean-out.

This equipment isn't high-speed, rather is for auxiliary operations. Yet even though the complete machine may be picked up and readily moved, it will clean about 100 lb. of beans in 2 min.

A portable industrial vacuum cleaner may be attached to remove the dust from beneath the machine while the beans are being cleaned.—*William B. Dress, Production Foreman, Family Products Co., Philadelphia.*

Trent– Pioneer in Welded Tubing

Since it was formed nearly 15 years ago, the Trent Tube Company has led the welded tube industry in new developments to bring you better quality stainless pipe and tubing.

Trent was first, for example, to commercially produce welded tubing using a helium-gas shielded arc and nonconsumable electrode. This process, called TRENTWELD, was used exclusively by Trent for seven years, although today all welded stainless tubing is made by the inert-gas shielded method. The TRENTWELD process produces an exceptionally sound weld, free from gaseous inclusions and without contamination from extraneous metal. In fact the chemical and physical properties of TRENTWELD tubing are as good or better in the weld zone as in the body metal of the tube.

Recognizing that the uses for as-welded tubing were limited primarily to ornamental applications, Trent also led in developing and improving after-welding processing methods. Today Trent's cold working, annealing, pickling and passivating, testing, and inspection operations are unsurpassed in the welded tube industry.

Now, with Trent's new patented *Contour-Welding* process – another major and exclusively Trent development – you are assured of the highest quality stainless pipe and tubing available anywhere when you specify TRENTWELD.

Contour-Weld*

a major development in stainless pipe

Big news for stainless and high-alloy pipe and tubing users! It's Trent's brand-new, patented *Contour-Welding* process that brings you the true uniformity of welded pipe and tubing, *plus complete absence of weld bead or undercut. Contour-Welding* produces a pipe and tube so smooth, so uniform that the weld is practically imperceptible.

And it means improved physical properties . . . better finish . . . elimination of cavitation corrosion or erosion. Flared or flanged ends are smoother, too. In fact, by whatever test you choose, Trent's *Contour-Welded* pipe and tubing will outperform any other pipe or tubing.

Here's why — *Contour-Welding* makes use of all the best features of the original Trentweld process — uniform stainless or high-alloy strip . . . controlled inert-gas shielded arc welding . . . absence of any filler rod. But there's *one vital difference.* In *Contour-Welding* the weld is made at the bottom of the formed strip. Gravity works to pull down the molten weld metal until it perfectly matches the contour of the pipe.

Like most good ideas, *Contour-Welding* sounds simple. But until Trent redesigned and rebuilt their mills, no equipment had ever been made to allow continuous welding at the bottom of the pipe or tube.

Wider range of grades available — Improved physical and metallurgical properties afforded by *Contour-Welding* make it possible to produce welded pipe and tubing in grades and sizes not readily available before in acceptable quality. Now, for example, you can get *Contour-Welded* Hastelloy, Zirconium, Zircoloy, Titanium and 19-9-DL grades.

Try Trent's new *Contour-Welded* pipe or tubing for yourself. Whether it's for corrosion or heat resistance — pressure or mechanical applications, you'll find *Contour-Weld* best. Prove it. Ask for a sample, and give it any test you like. It's the quickest way to satisfy yourself that *Contour-Welded* pipe and tubing outperforms all others. And remember, it's made by Trent — tube mill specialists.

*Contour-Weld is the trade mark of the Trent Tube Co. for its process of welding pipe and tubing which is protected under U. S. Patent 2,716,692.

Why Trent's Exclusive *Contour-Weld* Process means smoother welds . . .

Here's the conventional way of welding pipe. Gravity pulls some of the molten metal down into the pipe to form a bead that is extremely difficult to remove by cold working. This is particularly troublesome in heavier gages. Cold working of the inside bead can lead to undercuts, focal points for erosive and corrosive attack. Cleaning is difficult.

Trent couldn't repeal gravity, so they put gravity to work. They flopped the pipe over, and made the weld at the bottom. Gravity still pulls the molten metal down — but, in doing so, it makes the weld contour correspond to the contour of the pipe itself. That's why there's no tell-tale bulge of weld metal on the critical inside pipe surface. And, even on the outside surface, the weld contour more closely approaches that of the parent metal than any other welded pipe.

TRENTWELD **STAINLESS STEEL TUBING**

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

For more information, use coupon on last page.

A for apple is the beginning of most primers. And apple is the first choice in flavor with most Americans, who enjoy an alphabet of apple dishes. To the distinguished family of Firmenich flavors, now enhancing many food products, is added that of Apple, captured by patient research and recreated by chemical skill. It is another Firmenich achievement, already welcomed by manufacturers who have added this popular flavor to their line of products; by others to improve those already established. Highly concentrated, stable, of the utmost fidelity and purity, imitation Apple by Firmenich is offered with pride for your profitable use. Samples and technical data on request.

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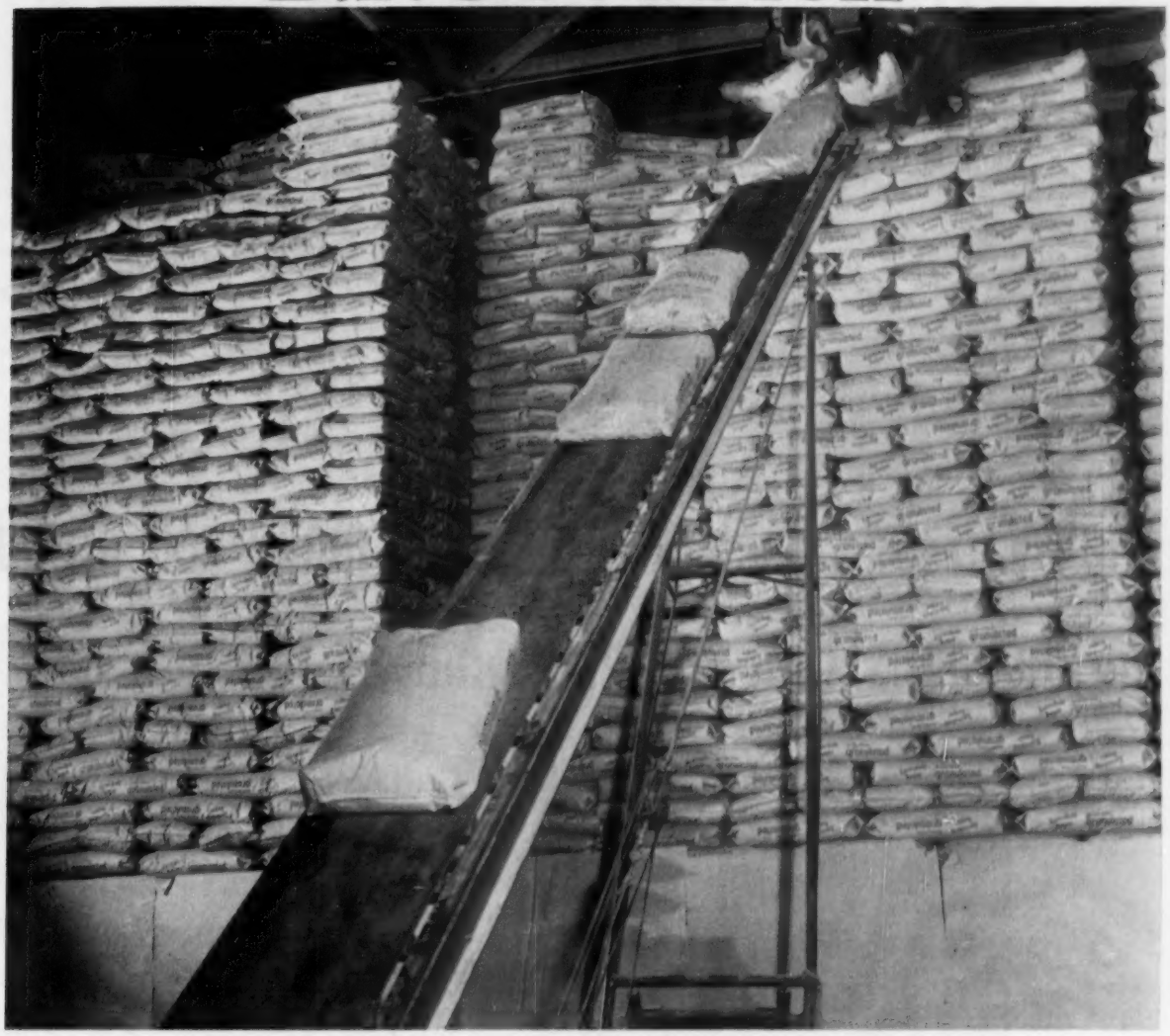
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



It builds a wall of sugar

A typical example of B. F. Goodrich improvement in rubber

THE higher, the better — thousands of sacks of sugar had to be stacked in this warehouse. The higher the stacks, the more sugar that could be stored.

But the height has always been limited by the stacking equipment. Belt conveyors have long been used. But even with special knobby-surfaced belts, the sacks slipped down the conveyor when the pitch was too steep. A lot of storage space wasn't being used.

B. F. Goodrich engineers went to work on the problem. The result is the B. F. Goodrich Ribflex belt you see in the picture. It gets its powerful gripping action from thousands of flexible rubber blocks that cover the belt surface. These tiny blocks are tough enough to last for years, yet soft so they bend just enough to grip anything carried by the belt and move it easily, quickly, without a slip.

Now, thanks to this B. F. Goodrich improvement, the Ribflex belt carries twice as many sacks at a time, climbs at a steep 45° angle, makes it possible to stack 42 sugar bags where 30 were the limit before.

B. F. Goodrich engineers are constantly finding ways to make rubber products save money for users — either by doing a job other rubber can't do, or by lasting longer, or by replacing other more expensive materials. Your B. F. Goodrich distributor can show you, right in your own plant, where these improvements can cut your operating costs. Call him when you need rubber. *The B. F. Goodrich Company, Department M-486, Akron 18, Ohio.*

B.F. Goodrich
INDUSTRIAL PRODUCTS DIVISION

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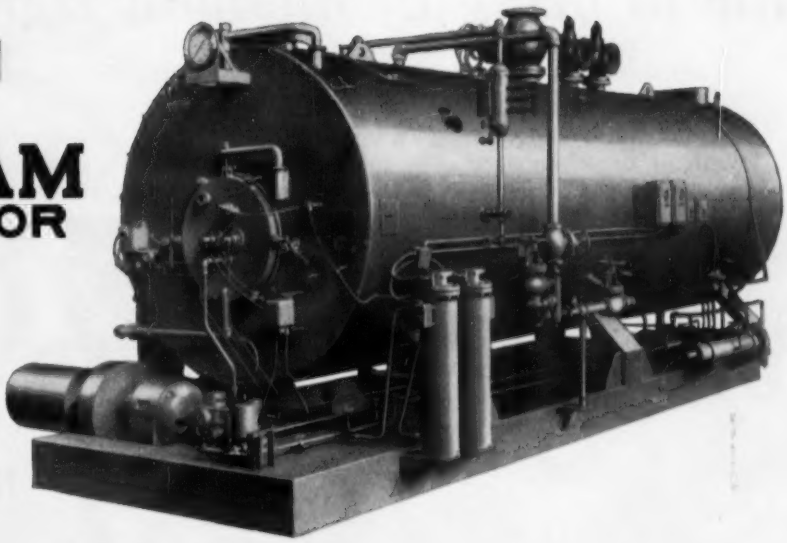

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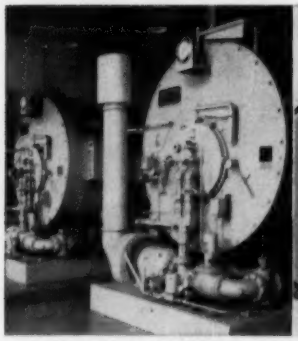
20 sizes, 10 to 600 H.P., 15 to 200# W.P., oil, gas or oil-gas combinations with quick fuel switchover feature.



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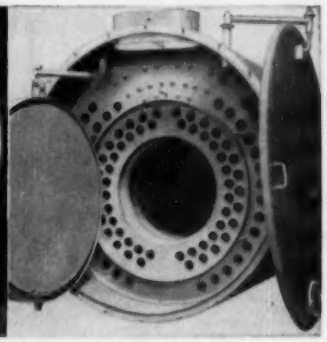


EASY TO CLEAN

Ames-designed davit hinged flue covers and baffle provide quick and complete access to the furnace and all tubes.

SAVINGS IN FIRST COST!

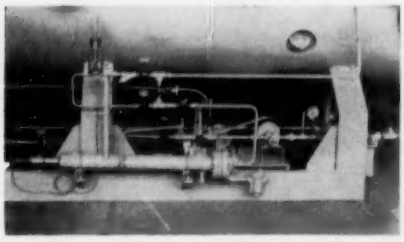
Your purchase price includes complete unit — no hidden "extras" to buy later on!

SAVINGS AT INSTALLATIONS

Just set on level concrete floor, connect to service lines and breeching. Nothing to assemble. No brick work required.

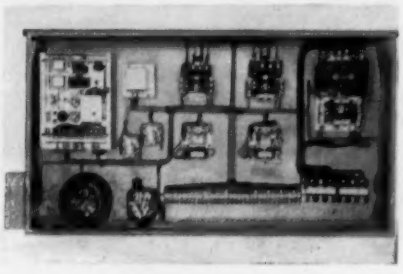
SAVINGS IN OPERATION

A minimum of supervision — lower manhour requirements for maintenance — easily replaced inexpensive plastic refractories — 80% thermal efficiency.



AMPLE ROOM

underneath for servicing auxiliary equipment. Control panel at eye level.



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how to bring a salesman right to the shelf!

Three of the many groups of foods and beverages that are increasing sales through

You can give your carbonated beverage health appeal for just a *fraction of a cent* per bottle. That's all Pfizer vitamin-fortification costs. Bottlers are already using Vitamins B_1 and C as successful sales boosters to today's vitamin-conscious public. Vitamin B_{12}, a factor in child growth, is also being considered. Pfizer will be glad to work with you in fortifying your beverages.

It's a smart sales move to enrich flour, macaroni, corn meal and similar products with Pfizer BI-CAP® enrichment concentrates. They give such products more *food value*. This meets the increased demand for foods of all varieties in the diet that contribute to good nutrition—*regardless of calorie count!* Let Pfizer show you how BI-CAP can add sales appeal to *your* product.

A vital "plus" to help you sell your product in today's self-service food store

The grocery shelf on which your product stands is the point of *decision* for the consumer. Your package, your product and its ingredients are the main selling forces employed at that point in the all-important job of making that consumer put *your* brand in her shopping cart. And that's where Pfizer's vitamin fortification and enrichment program can become a "star salesman" for your product! For extra vitamin sales-appeal displayed on your package aims right at the basic desire of every shopper to give the family maximum nourishment. Your Pfizer sales representative is the logical man to see for the full story on how Pfizer vitamins, at nominal cost, can substantially increase your product's sales potential. He's backed by over 18 years of Pfizer vitamin experience in working with manufacturers of many types of foods and beverages. It's truly worth your while to talk to him.

Pfizer vitamin fortification and enrichment

To fortify your sales position in the canned juice, concentrate and fruit "ade" market, fortify these products with Pfizer vitamins. Health is a prime reason why people drink fruit juices. "Vitamin Fortified" on your label is a strong inducement to buy *your* brand. What's more, your vitamin content is standardized, offsetting processing losses and seasonal variations.

CHAS. PFIZER & CO., INC.

Chemical Sales Division

630 Flushing Ave., Brooklyn 6, N. Y.

Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.

Manufacturing Chemists for Over 100 Years

Pfizer

Whenever you have a food processing problem, talk it over with your Pfizer sales representative. He'll be glad to assist you.

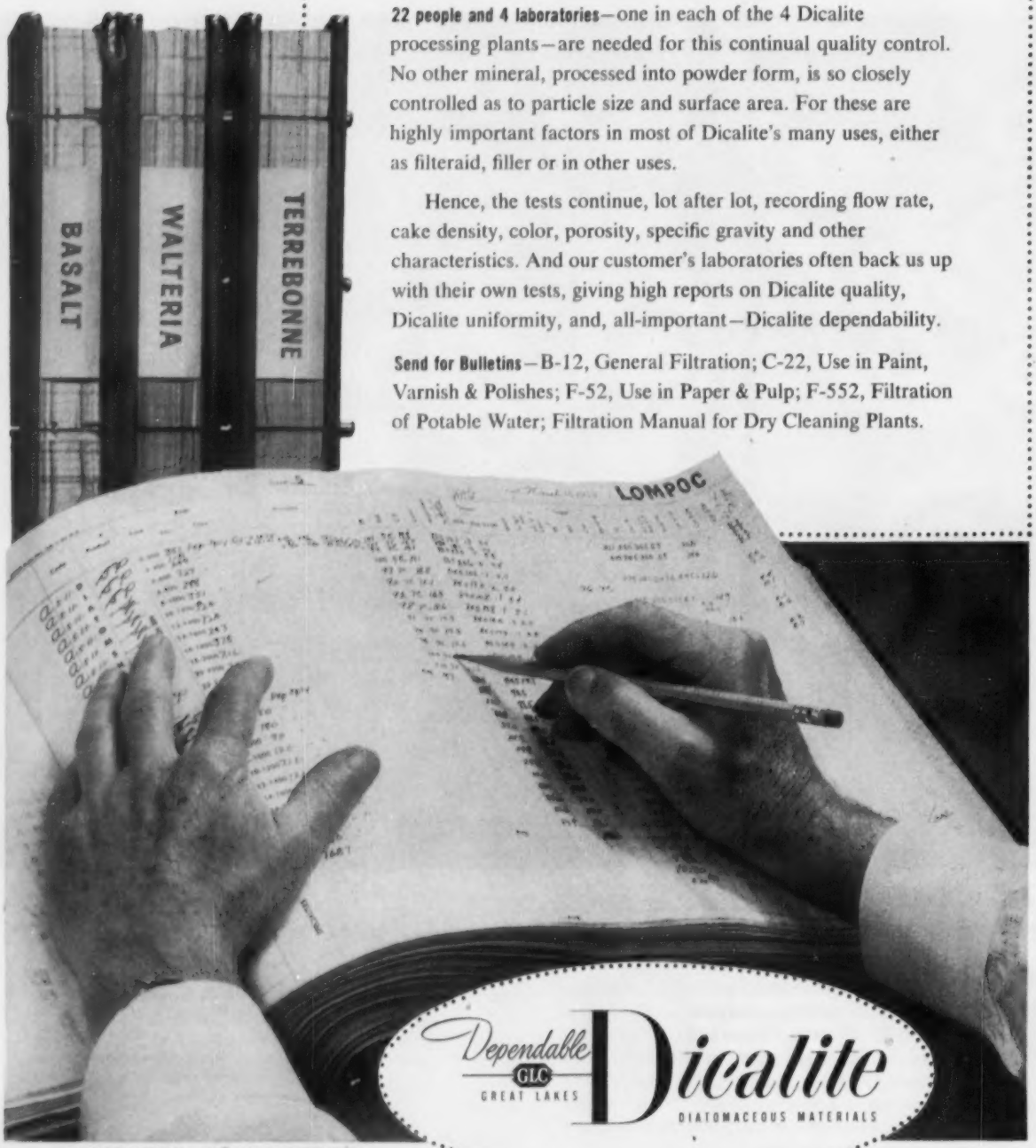
23,896 "Watchdogs" Every Month...

That's the *average* number of laboratory tests we make each month to insure that every run of every Dicalite product will render uniformly high performance. (The actual number varies, and depends on the different Dicalite products run.)

22 people and 4 laboratories—one in each of the 4 Dicalite processing plants—are needed for this continual quality control. No other mineral, processed into powder form, is so closely controlled as to particle size and surface area. For these are highly important factors in most of Dicalite's many uses, either as filteraid, filler or in other uses.

Hence, the tests continue, lot after lot, recording flow rate, cake density, color, porosity, specific gravity and other characteristics. And our customer's laboratories often back us up with their own tests, giving high reports on Dicalite quality, Dicalite uniformity, and, all-important—Dicalite dependability.

Send for Bulletins—B-12, General Filtration; C-22, Use in Paint, Varnish & Polishes; F-52, Use in Paper & Pulp; F-552, Filtration of Potable Water; Filtration Manual for Dry Cleaning Plants.



Dependable GLC GREAT LAKES Dicalite DIATOMACEOUS MATERIALS

DICALITE DIVISION • GREAT LAKES CARBON CORP.
612 S. FLOWER ST., LOS ANGELES 17, CALIFORNIA

Jenkins designed for trouble-free performance... a

STAINLESS STEEL "Y"

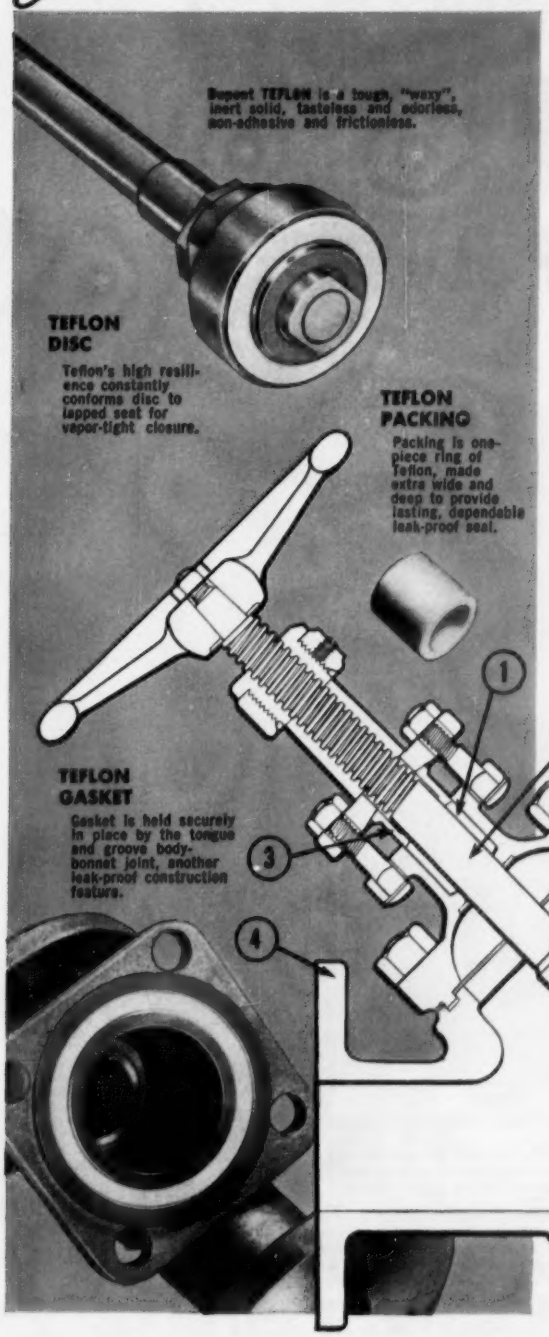
to lower costs in a wider range of

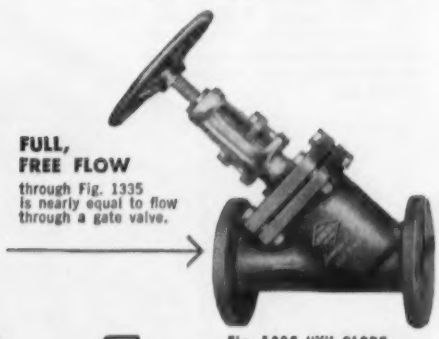
CORROSIVE SERVICES

For food and chemical plants, and similar services, Jenkins Fig. 1335 "Y" Globe offers many advanced features that will lower operating costs and keep your processing lines trouble-free. The disc, packing, and gasket are tough, resilient Teflon. Tasteless and odorless, it eliminates problems of contamination.

The "Y" pattern permits full flow, nearly equal to that of a gate valve, and also provides the vapor-tight closure and the ease of disc renewal of a globe valve.

Fig. 1335 offers extra value by any test . . . *initial cost, operating efficiency, low maintenance.* You can convert this extra value into *extra savings* on your toughest corrosive services. Call your Jenkins Distributor, or write: Jenkins Bros., 100 Park Ave., New York 17.


Dupont TEFLON is a tough, "waxy", inert solid, tasteless and odorless, non-adhesive and frictionless.
TEFLON DISC
Teflon's high resilience constantly conforms disc to lapped seat for vapor-tight closure.
TEFLON PACKING
Packing is one-piece ring of Teflon, made extra wide and deep to provide lasting, dependable leak-proof seal.
TEFLON GASKET
Gasket is held securely in place by the tongue and groove body-bonnet joint, another leak-proof construction feature.
1
2
3
4



FULL, FREE FLOW
through Fig. 1335 is nearly equal to flow through a gate valve.

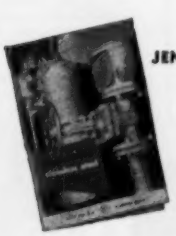
Fig. 1335 "Y" GLOBE
150 lbs. O.W.G. at 500°F
230 lbs. O.W.G. at 100°F
Sizes 1" to 4"

(1) **Packing Box**—Exceptionally deep and wide to hold optimum size packing.

(2) **Spindle**—Polished shank, long-operating threads, bevel shoulder for backseating.

(3) **Gland**—Two-piece for equalized pressure, tight seal.

(4) **Flanges**—Conform to M.S.S. Standard Practice S.P.42 Specifications.



JENKINS STAINLESS STEEL VALVE BOOKLET illustrates and describes wide range of Jenkins Globe, Gate, Check, and Y Valves, includes selection data, survey forms. Ask for Form 200-A.

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VALVES
SINCE 1864 TRADE JENKINS MARK
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we'll test grind a sample for you

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Superfine

PULVERIZER

What is your milling problem—uniformity? fineness? Do you need increased output at a lower cost? Without obligation to you, we'll grind a sample of your material in our pilot plant, using a production model Schutz-O'Neill "Superfine" Pulverizer. We'll return your processed product with our Engineering Test Report giving exact data and including recommended Schutz-O'Neill equipment, methods and mill plans for your job.

This will give you full information on the versatility, particle size range and capacity of Schutz-O'Neill "Superfine" Pulverizers. Backed by more than 60 years of continuous manufacturing and field experience.

SCHUTZ-O'NEILL PILOT PLANT uses a standard production model 16" Superfine Pulverizer. Mill components on wall at left in photo provide up to 100 different pulverizing set-ups, with a range from 40 mesh to 5 microns.

Below are two typical pulverizing problems that were solved by SCHUTZ-O'NEILL

No. 1 Pulverizing 200-Mesh Cocoa Powder

THE PROBLEM: Continuous production of 99.5% minus 200-mesh medium and high butter fat cocoa powder. Material is heat sensitive and begins to cake at temperatures prevailing in dry material pulverizers.

THE TESTS: Schutz-O'Neill Company, based upon many years' experience in pulverizing cocoa powder, ran extensive pilot plant tests on cocoa powder containing 16% and 22% b.f. Exhaustive study of the problem, and evaluation of results of the pilot plant runs indicated continuous production of 200-mesh 16% b.f. powder was practical when temperature of feed material did not exceed 70° F. Continuous production of 200-mesh, 22% butter fat cocoa powder was practical with refrigeration equipment lowering temperature of grinding chamber to 35° F.

RESULT OF TESTS: Three major chocolate companies in the United States now use Schutz-O'Neill Superfine Pulverizers for high quality, extra fine breakfast cocoa production.

No. 2 400-Mesh Powdered Sugar

THE PROBLEM: Capacity production of extremely fine powdered sugar (all finer than 400-mesh) for one of the country's major sugar refiners.

THE TESTS: Schutz-O'Neill conducted a 24-hour continuous production run in their pilot plant with pulverizer set to produce sugar with a top size of 40 microns, for use in a new fondant-type sugar. Analysis of pilot plant material in sugar refiner's own laboratory and by impartial University specialist showed product to meet specifications. The mass mean particle size analyzed to average 12 microns, with 99.8% minus 40 microns.

RESULT OF TESTS: A Schutz-O'Neill 28" Superfine Pulverizer is now used for regular production of 400-mesh powdered sugar by this refiner.

WHAT IS YOUR PROBLEM? Write Schutz-O'Neill—take advantage of their 60 years experience in solving pulverizing problems.

Write Us:

Tell us the stock you want to pulverize, fineness, capacity desired; we'll send shipping instructions. Or, write for literature desired on Schutz-O'Neill Pulverizers, Granulators, Roller Mills, Sifters, Cyclone Collectors, Hammer Mills.

ESTABLISHED 1893

SCHUTZ-O'NEILL COMPANY

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Mack's

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Mack's carefully-planned, well-designed, cab-forward series with the Verti-Lift cab *holds all the aces* for efficient hauling of maximum standard or specialized cargoes, in city delivery services or over the road. Take a quick look at all their features, and you'll see why:

COMPACTNESS. One full foot shorter than any other C.O.E. Only 68" from bumper to back of cab. Takes 20 square feet less shop space than tilt-cab trucks.

READY ACCESSIBILITY—EASY MAINTENANCE. Revolutionary new Verti-Lift cab goes straight up . . . in seconds . . . giving full exposure of front of chassis, engine, all accessories. Routine servicing is accomplished without raising cab.

"DRIVER'S DREAM" CABS. Full-view windshields give unsurpassed vision up, down, and to either side; improved, easily entered driver's position is comfortable and roomy. This wide-door 3-man cab is fully insulated and ventilated, easily heated, and fumeproof.

MANEUVERABILITY. Shorter turning diameter—for instance, with 81½" cab-to-rear axle dimension, turns can be made in a 34-ft. diameter circle. Easy parking and steering. Simple, conventional controls. Proved Mack Magnadyne® engine provides ample power for the steepest hills, quick pick-up in stop-and-go city traffic.

DEPENDABLE, ECONOMICAL. Uses Mack-built, Mack-proved components with Mack's consistently powerful, fuel-saving engines, rugged, smoothly operating transmissions, dependable brakes. In every respect, these are real Macks—the longest-lived, most productive and economical units you can operate.

ADAPTABLE. 20,000 lbs. to 28,000 lbs. G.V.W. as platform truck, and as a tractor in the 40,000-53,000 lbs. G.C.W. range, four wheel or six wheel, this versatile cab-over is adaptable to your specific requirements.

Come see them—compare them against the trucks you now own, against any other C.O.E. Your Mack Factory Branch or Authorized Distributor will be glad to give you the complete story.

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try TITANIUM for the tough jobs

Take, for example, fish packing, where the corrosive attack of sea water and brine on equipment is a costly problem. It's no problem for REM-CRU titanium, though—for titanium is entirely immune to such attack. In fact, test samples of REM-CRU titanium were exposed to sea water and ocean atmosphere for *five years* with almost imperceptible effect . . . it would have taken 1250 years to reduce the thickness of the sample .001"!

Titanium can end corrosion problems, too, in vegetable canning – condiment bottling – any type of food processing where corrosive conditions are encountered.

For titanium has so many remarkable properties that until recently most of it was reserved for defense production. But *now* there are adequate amounts of REM-CRU titanium available for your use. And that's good news, for titanium can handle many tough jobs in the food processing industry better than any other material. REM-CRU, leading producer of titanium, will be glad to work with you in making the best, most profitable use of this versatile new metal.

To keep abreast of the latest developments on this vital metal, write to Dept.FE10 for the Rem-Cru Review—a free periodical presenting the latest technical data on titanium alloys.

REM-CRU TITANIUM

REM-CRU TITANIUM, INC., MIDLAND, PENNSYLVANIA

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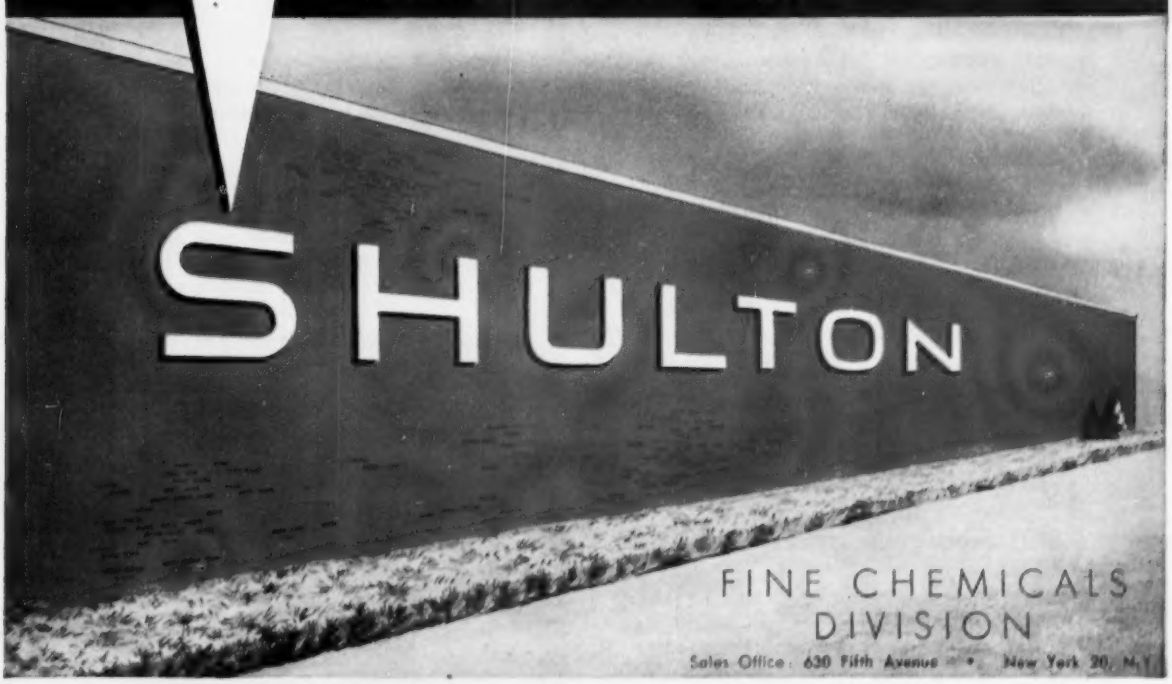
VANILLIN, U. S. P.
VANITROPE® brand propenyl guaethol
TRUE FRUIT CONCENTRATES

. . . are among the products Shulton is offering to the trade for highest quality effects in foods and beverages.

Superior quality plus special services are rapidly building for Shulton the reputation as an outstanding source for flavoring ingredients.

Your inquiries will receive our prompt attention.

Samples and Technical Information Available on Request.



FINE CHEMICALS DIVISION

Sales Office: 630 Fifth Avenue • New York 20, N.Y.

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Now! Instruments count costs, too!

In any type of manufacturing operation—whether candy or cable . . . bread or boats . . . silk or steel—you find one universal language spoken. It's the language of *costs*—and it must be spoken fluently.

How much—in gallons, pounds, cubic feet, kilowatt hours, time—must be translated into how much in *dollars* to give you an accurate accounting of costs?

Instruments can answer the question for you, with accurate records of flow, level, downtime, weight.

A new dimension in instrumentation

Instruments are doing an amazing job in measuring and controlling numerous process *conditions*—temperature, pressure, flow, pH, liquid level, specific gravity, and many others.

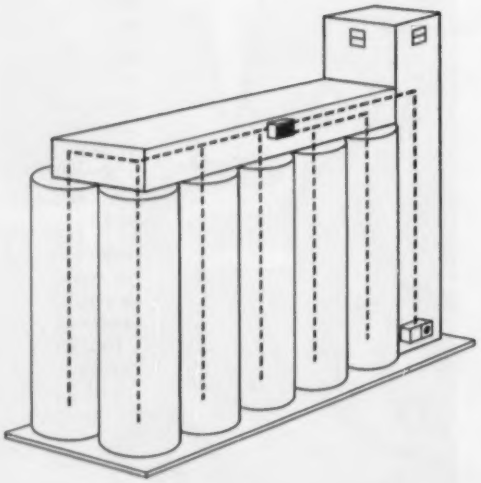
Instruments can do just as amazing a job in helping you measure process costs—automatically, faster, more accurately, and in a more penetrating way than ever before.

What kind of cost data can instruments collect?

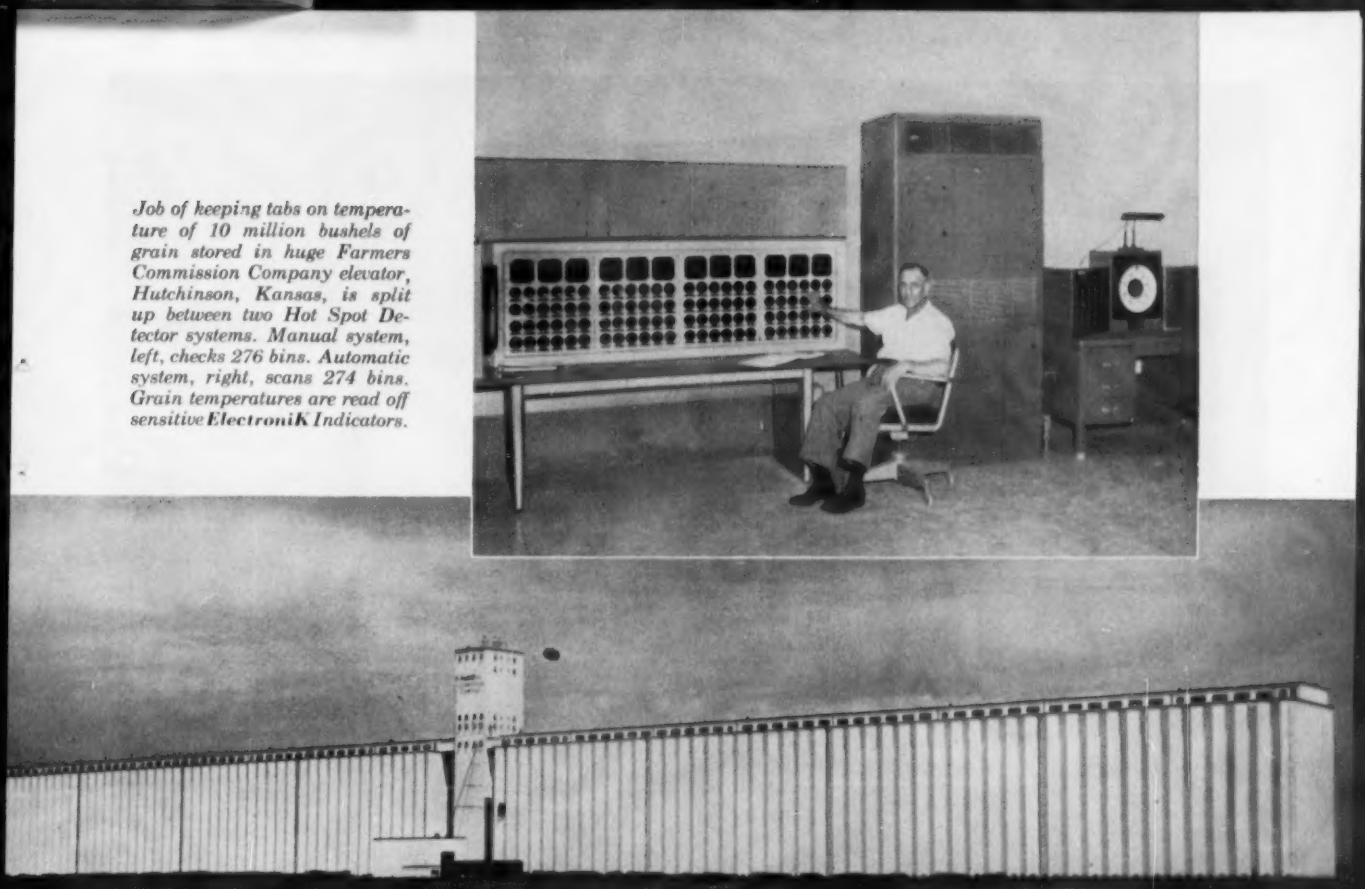
1. **Cost data related to flow of:**
   steam, water, gas, oil, chemicals, raw materials, intermediate products, finished products, by-products, wastes.
2. **Cost data related to levels of:**
   storage tanks, evaporators, vats, boiler drums.
3. **Cost data related to downtime of:**
   presses, production machinery, stills, boilers, dryers, pumps, compressors, other machines.
4. **Cost data related to weight of:**
   coal and other solid fuels, raw materials, intermediate products, finished products, by-products, wastes.
5. **Cost data related to the production and consumption of utilities.**

Your Honeywell sales engineer will be glad to fill you in on this important new field for instrumentation—instruments as an aid to cost accounting. Give him a call . . . he's as near as your phone.

Automatic temperature monitoring guards stored



Thermocouples spaced along suspended Nylon-covered sensing cable detect grain temperature at six-foot intervals in each of the 550 storage bins.



Job of keeping tabs on temperature of 10 million bushels of grain stored in huge Farmers Commission Company elevator, Hutchinson, Kansas, is split up between two Hot Spot Detector systems. Manual system, left, checks 276 bins. Automatic system, right, scans 274 bins. Grain temperatures are read off sensitive ElectroniK Indicators.

grain against spoilage

WHEN stored grain begins heating, it's a sure sign of trouble ahead. A rise in temperature, caused by insects, moisture pockets, dirt-chaff, or molds, signals the start of spoilage action.

With early warning of exactly when and where heat develops, however, operators can take immediate steps to protect their grain and guard against dollar loss. A dependable, foolproof system, developed and engineered by Hot Spot Detector, Inc., now senses the slightest rise in temperature anywhere in the grain and allows sufficient time to turn, fumigate, aerate, or dry the heating portions.

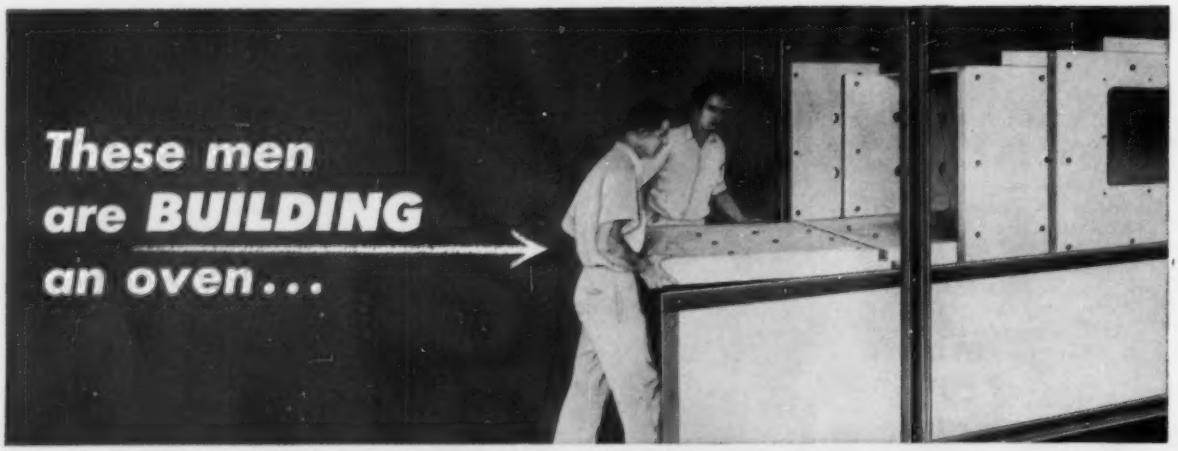
Heart of the Hot Spot Detector system is a sensitive *ElectroniK* Indicator which quickly signals temperature readings from thermocouples spaced at 3-, 6-, or 7-foot intervals throughout the stored grain. The Indicator, graduated from 0 to 150 F, has a big round dial which can be read as far away as 60 feet. Temperature readings are accurate to four-tenths of a degree. At various levels in every bin temperatures may be checked by means of manually switched controls . . . or scanned automatically, a thermocouple temperature report every four seconds.

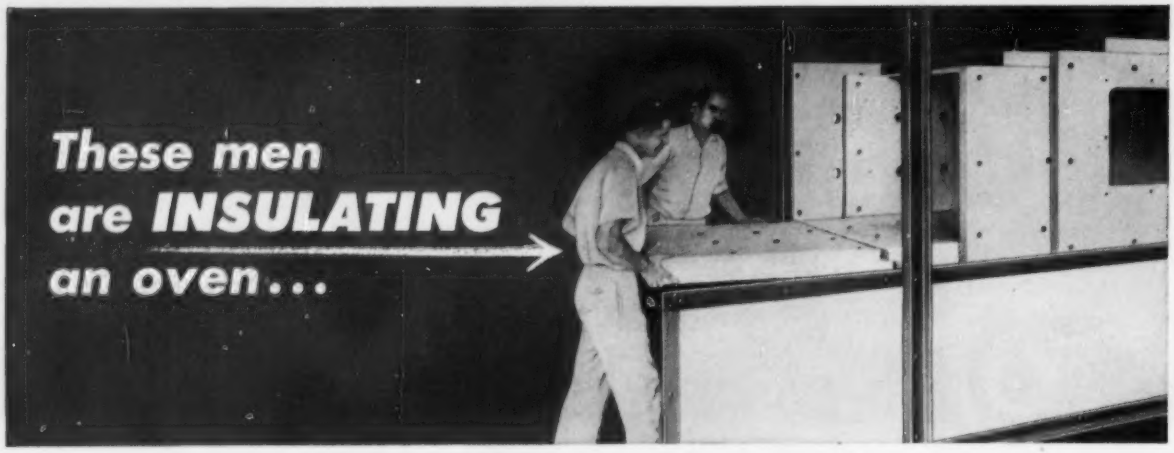
In terminals, sub-terminals, country stations, and flat storage, the accurate Hot Spot Detector system protects grain against expensive spoilage, provides a valuable guide to plant operation, and reduces the cost of operating elevators. The *ElectroniK* Indicator may be installed in headhouse, gallery, or office . . . for most convenient, centralized regulation.

Here is one more outstanding example illustrating how versatile *ElectroniK* indicators, recorders, and controllers are contributing to more efficient, more automatic, and more economical operation in the food industry. Ask your nearby Honeywell sales engineer to discuss ways in which *ElectroniK* instruments can benefit you. Give him a call...he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.—in Canada, Toronto 17, Ontario.

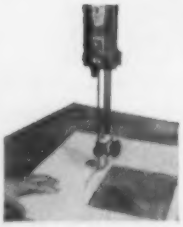
MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls





...with J-M MARINITE*—
the structurally strong insulation that controls heat to 900F

LARGE SHEETS speed construction, are light and easy to handle, provide maximum heat control.



EASY TO WORK, Marinite may be cut, drilled, and shaped with ordinary woodworking tools.

Provides economical operation. J-M Marinite permits uniform temperature control in ovens, driers and other high-temperature equipment. Low heat capacity . . . reduces heat-up and cool-off time. Homogeneous material won't bulge, settle or sag . . . eliminates "Hot spots." Outside framing cuts through-metal heat loss to a minimum.

Needs no maintenance. J-M Marinite is made from asbestos and diatomaceous silica. Unaffected by moisture . . . won't rust, rot, mold or corrode. Normally requires no protective coating. Easy to keep clean. Lasts indefinitely without replacement. Minimizes down-time.

Easy to erect. J-M Marinite builds and insulates in one operation. Easily fabricated with woodworking tools. Can be applied by your own construction crews . . . no special training needed. Goes up fast with minimum angle-iron framing.

Write for new Marinite brochure IN-153A to Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit, Ontario.

*Marinite is a registered Johns-Manville trade mark.

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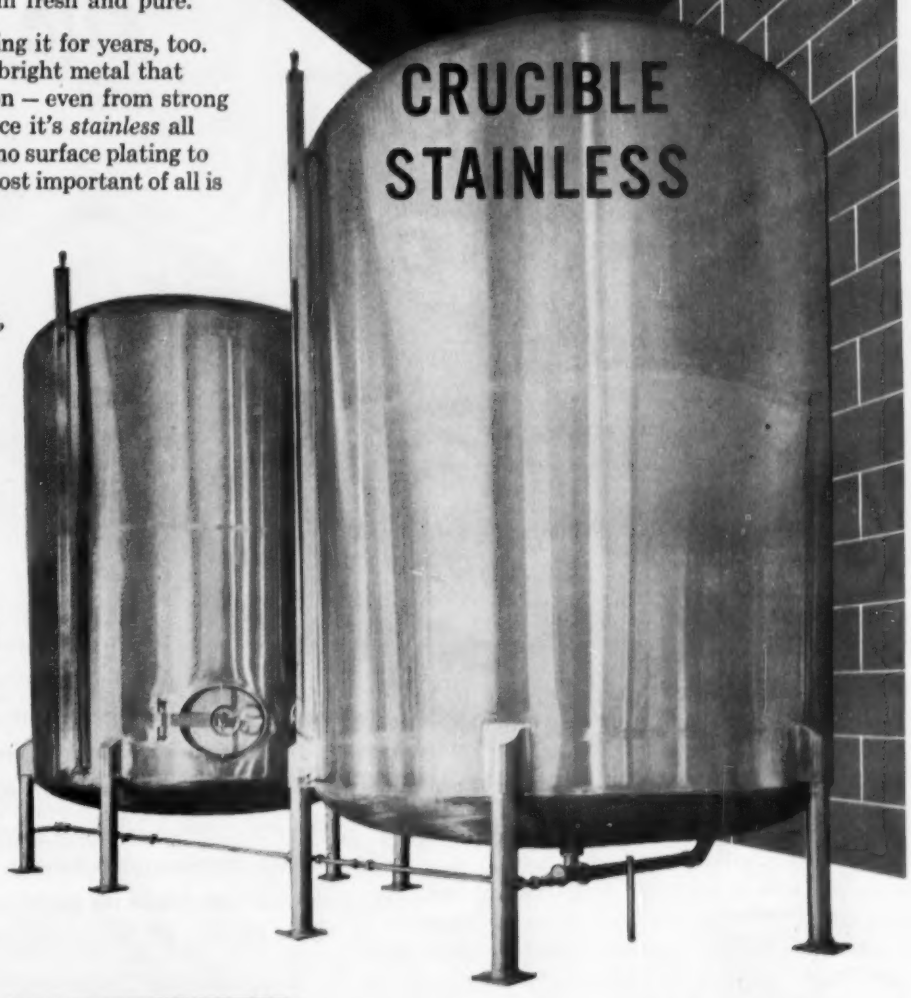
Johns-Manville *first-in* INSULATION

MATERIALS · ENGINEERING · APPLICATION

drinks that "hit the spot" *are flavor-protected with*



These gleaming stainless steel tanks, made by the Metal-Glass Products Company, Belding, Michigan, protect the delicate flavors of cola drinks. And they help keep them fresh and pure.

They'll keep right on doing it for years, too. For stainless is a tough, bright metal that resists wear and corrosion – even from strong cleaning agents. And since it's *stainless* all the way through, there's no surface plating to chip or wear away. But most important of all is the fact that stainless is inert . . . *it never adds unwanted flavor to beverages – even dairy products.* And, of course, stainless is a snap to keep spotlessly clean.

That's why it's *standard equipment* for tanks, pasteurizers, bottlers, piping, fittings—*everywhere* that food and metal come in contact. It's the most *practical* choice you can make. So next time you're buying equipment make sure it's of Crucible stainless steel. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh* 30, *Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

For more information, use coupon on last page.

Satisfaction rests on the carton

Schlitz is a dependably-good favorite in millions of homes. Dealers welcome this fast-selling beer too. It is attractively packaged, strongly promoted, securely delivered.

Retail sales clerks are stacking displays of Schlitz today—by the bottle, can and carton. UNION is among the major suppliers of corrugated shipping containers for Schlitz.

Union cartons deliver the goods safely, do an effective merchandising job as well.

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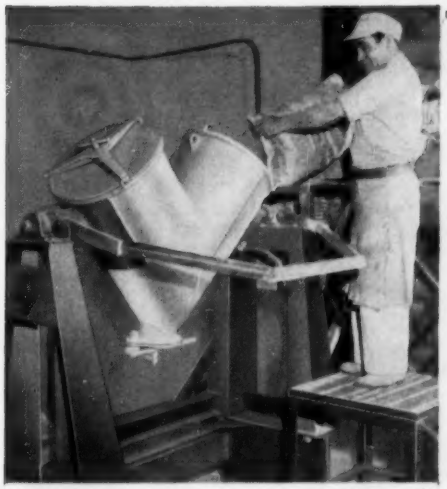


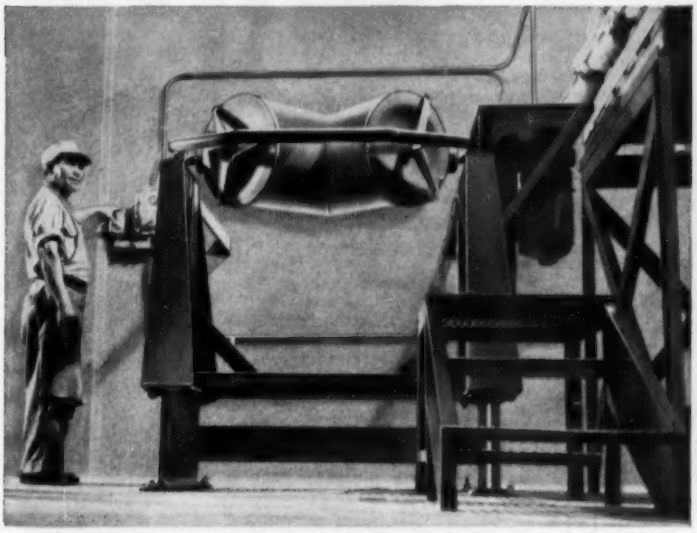
UNITED PRESS

Production worker Cruz Flores starts filling p-k twin shell blender with limestone flour. Pencillin drugs are also added, *then*...

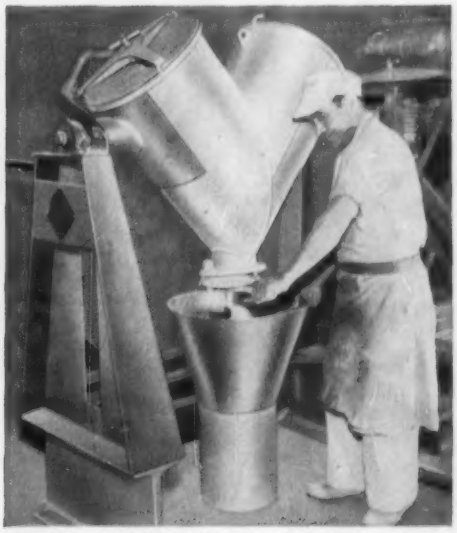
At the Los Angeles plant of Pillsbury Mills, Inc. . . .

p-k "pays the freight"

p-k Twin Shell Blender* mixes dry feed locally— cuts freight costs, ends delays.



After pushing starting button, Flores is free for other work until mixing is completed. Power consumption is low because of p-k's unique patented design. *Finally*...



Dust-tight slide valve is opened, thoroughly blended feed flows out freely from p-k's smooth, obstruction-less interior.

When your blender gives a thorough mix, does it fast, and is easy to operate and maintain—then it's a cinch to "roll your own." In fact, sometimes it's even better! That's the conclusion of Pillsbury Mills, Inc., Los Angeles plant, and they know by experience.

Mixtures of anti-biotic-treated feeds were previously shipped west from the main plant in Iowa. "If there was a critical hold-up in deliveries," says Los Angeles plant superintendent Charles F. Wilson, "we faced a stalemate in operations. Moreover, there were freight costs. Now, with our p-k blender, all that is changed."

"The time and labor required to operate it is negligible," in Mr. Wilson's words, and both discharging and cleaning are equally easy. Absence of interior obstructions means free material flow, and "...we just haven't had any maintenance problems."

p-k twin shell dry blenders are continually making records in dozens of other fields—for speed, ease of operation, uniformity of blend. Send us a sample of your materials for a thorough blending analysis—or write today for fully illustrated Catalog 12.

*Patented

the **Patterson-Kelley Co.,** inc.

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2845

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You can choose from Angelica's huge stock of styles and fabrics. Or if you have a unique problem requiring special uniform features, Angelica can solve that, too!

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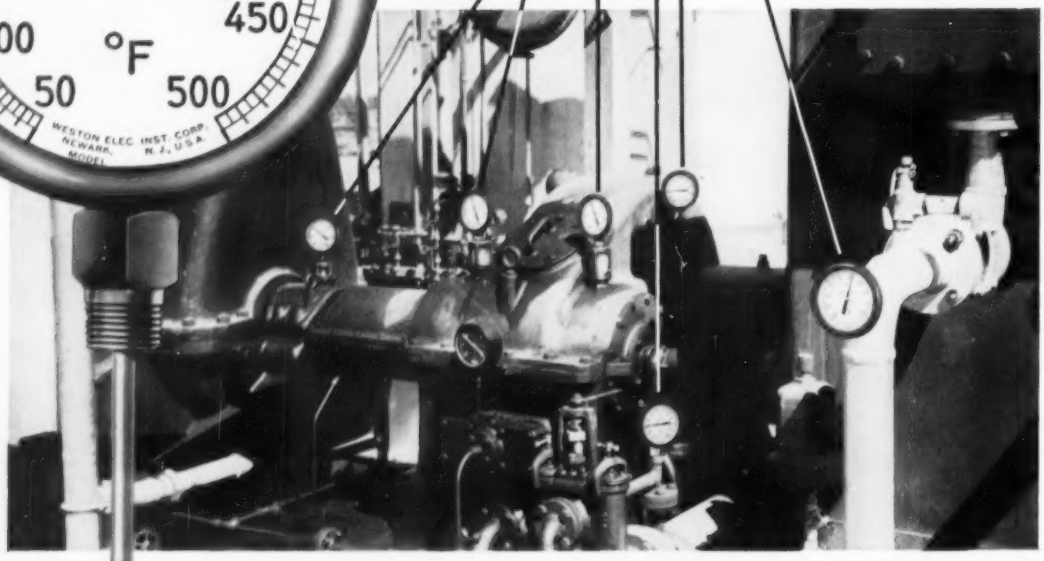
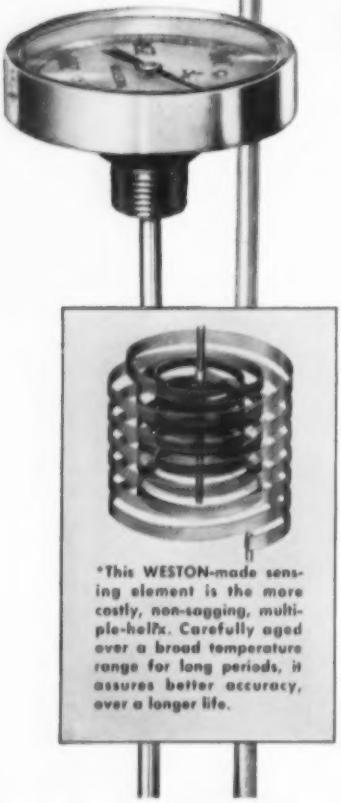
AT EVERY CHECKPOINT





*This WESTON-made sensing element is the more costly, non-sagging, multiple-helix. Carefully aged over a broad temperature range for long periods, it assures better accuracy, over a longer life.

WESTON *all-metal* THERMOMETERS

(with Multiple Helix)*

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

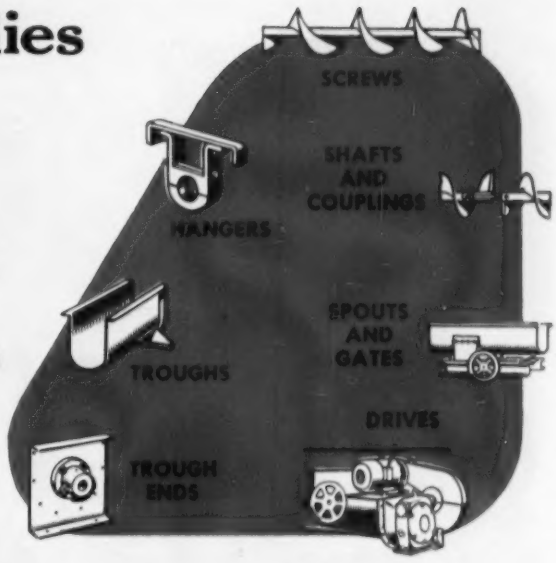
Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.

WESTON 5537

Thermometers

Stocked by leading Distributors

How Link-Belt applies STANDARD or SPECIAL screw conveyors to meet your needs



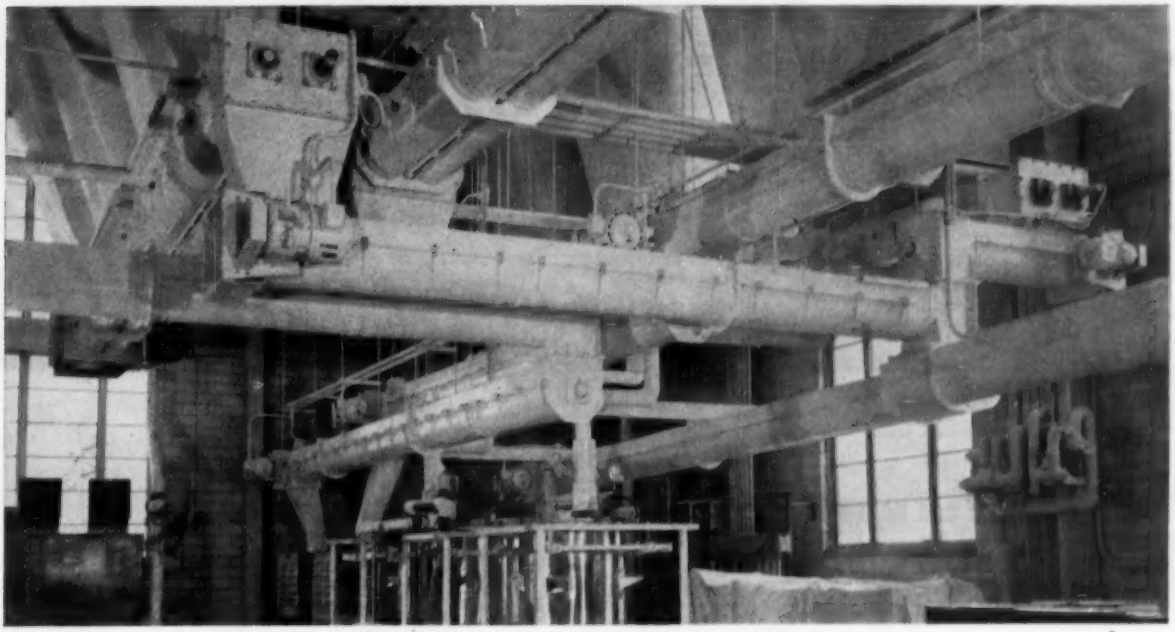
This 4-phase service saves you time . . . spares you details

ANALYSIS AND ENGINEERING service is provided by a district sales office in your area. From long experience, Link-Belt District Engineers can quickly ascertain the best conveying arrangement for you.

COMPLETE LINE OF SCREW CONVEYOR COMPONENTS and related elevating, conveying and power transmission equipment is your assurance that specific needs are fulfilled efficiently and economically.

EASY ERECTION is achieved because of pre-fitting, match marking, close-tolerance manufacturing and Link-Belt drawings. Link-Belt will handle erection if you wish.

SATISFACTORY PERFORMANCE is assured when you rely on Link-Belt as a single contract source for your complete system. We will accept full responsibility for placing it in operating readiness.



At Midwest bakery, Link-Belt twin screw feeders and screw conveyors provide sanitary handling of sugar and flour to bins and sifters.

Extensive engineering experience has provided Link-Belt with standard solutions to specialized screw conveying requirements. In addition, local availability of Link-Belt engineering service and quality components assures prompt, efficient action. That's why—whether you plan a complete new system or improvement of present arrangements—a call to your nearest Link-Belt office is a sure step to lower handling costs.

LINK-BELT

SCREW CONVEYOR EQUIPMENT

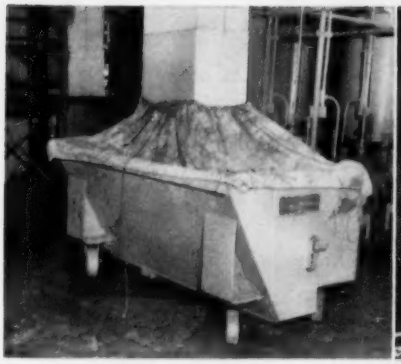
LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,012

For more information, use coupon on last page.

Here's *MASS-HANDLING* of bulk

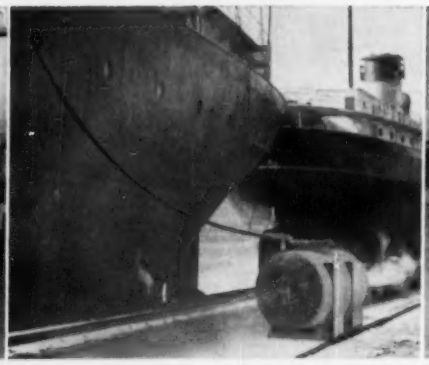
What you see above is a Dempster-Dumpster serving one of its detachable containers. Multiply this simple pick up, haul and dump operation by scores of steel containers built to meet your requirements for handling waste or salvable materials, raw and finished products, fluids including acids, combustibles, dusty materials, etc. You have, then, mass-handling of bulk materials with one truck and one man!

DEMPSTER BROTHERS



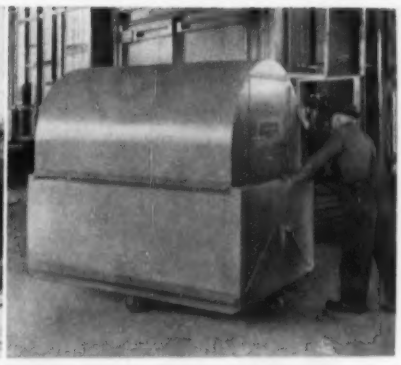
Tilt Type Container is handling filter dirt at a plant in Illinois. Note container is equipped with casters and placed under chute, through which the filter dirt passes directly from presses. As each container is filled, it is replaced with an empty one.

Three heavy duty Drop Bottom Type Containers, shown below, are loaded with cast iron fittings from conveyor at plant in Birmingham. Dempster-Dumpster picks up each container when loaded and hauls the finished products to shipping department.



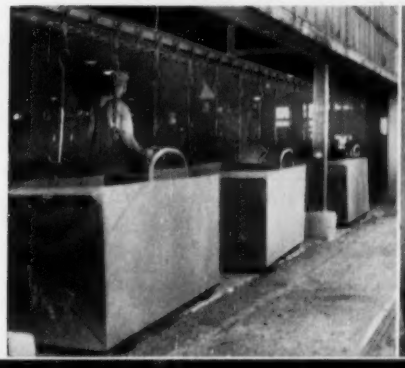
Tank Type Container is being filled with used oil from a ship. Time required to haul loaded container to reclaim station, drain and return for refilling—10 minutes. Time cycle of the former method using conventional barrels—60 minutes.

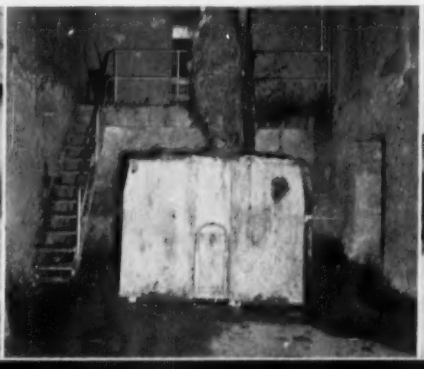
Here's another example of the many types of waste materials handled by this system. The Skip Type Container shown below is located under hydropulper at a paper plant. Picture was shot while container was being filled with rope waste sludge.



A loaded Apartment Type Container, equipped with roller bearing casters, is being rolled to outside of this plant building. Dempster-Dumpster will pick it up, haul to disposal area, dump the refuse and return empty container for refilling.

Waste materials are loaded into these Universal Containers at a food plant warehouse. Containers have lids in top, as well as a door in each end, which are opened to make deposits, then closed, sealing materials in container.





materials with one truck...one man!

A FEW OF THE HUNDREDS of containers available are shown above in actual service. They are built in capacities up to 21 cu. yds.—several times the capacity of the average dump truck body. One Dempster-Dumpster, operated by only one man, the driver, serves scores of big detachable containers, one after another—handling materials of every description. It's like having one truck with scores of bodies!

Records of performance in dozens of installations prove beyond question that savings are tremendous! The Dempster-Dumpster System cuts costs of equipment and operation. It is common knowledge that one Dempster-Dumpster will perform the work of several conventional trucks, reducing investment accordingly. This system eliminates standing idle time and re-handling of materials. Once placed in these containers, materials remain there until hauled to destination. Efficiency, sanitation and good plantkeeping are big advantages. Materials to be transferred or disposed of are constantly being placed in the containers as they accumulate. Containers for handling refuse are fire-proof, rat-proof and scavenger proof.

With no obligation on your part, our engineers will be glad to make a comprehensive fact-finding survey to determine the cost-cutting possibilities of this equipment in your plant. Write us for complete information today! Manufactured exclusively by Dempster Brothers, Inc.

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Special Starches

for

frozen foods

What happens to your

starch thickener

between freezing and thawing?

- **Are you troubled with:**
  - — lumping or cheesy texture
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  - — masked flavor
  - — clouded color?
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  - — processing methods
  - — variances in equipment?

National is in a position to help you—with a variety of special starches to meet the individual needs of your foods from soup to dessert. Our food technologists will be happy to work with you. Write or telephone for samples and data.

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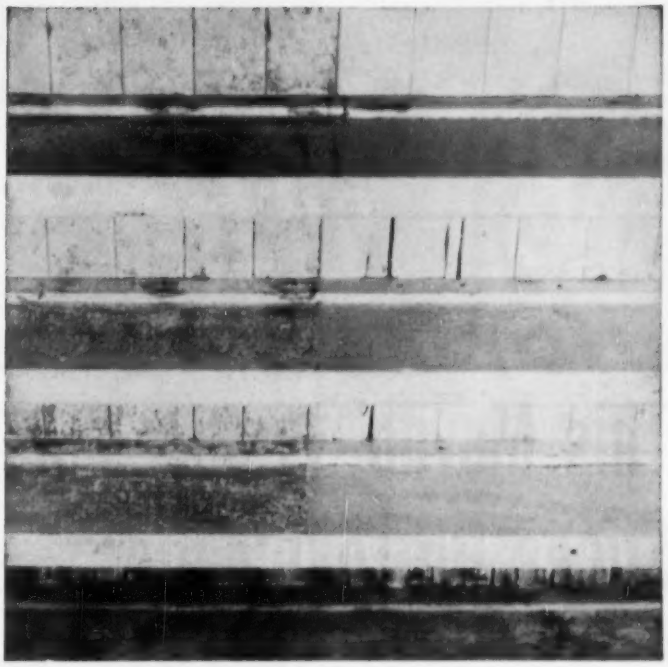
NEW DU PONT ODORLESS MILDEW-RESISTANT ENAMEL

solves mildew problem in hundreds of food plants

Food-plant managers across the country have found that Du Pont Odorless Mildew-Resistant Enamel Oyster White retards the growth of most types of mildew on walls and ceilings. Formulated with solubilized copper-8-quinolinolate fungicide, Du Pont Mildew-Resistant Enamel is especially suitable for meat-packing plants, poultry and cheese plants, creameries and other areas where mildew presents a major problem. Tests prove that in most types of food processing plants it effectively retards mildew formation for months . . . eliminates the need for constant cleaning and scrubbing. And Du Pont Mildew-Resistant Enamel resists chipping and cracking . . . stays bright-looking month after month. What's more, when you consider the expense of constant cleaning, you'll realize just how economical this superior maintenance finish is. Mail the coupon today for complete information.



Photograph shows section of beamed ceiling in food-processing plant after three years' exposure. Lower strip: cleaned but left unpainted. Upper left: painted with ordinary non-fungicide enamel. Upper right: painted with Du Pont Mildew-Resistant Enamel.

Check these important advantages:

- ✓ **Effectively retards most types of mildew**
- ✓ **Cuts maintenance costs**
- ✓ **Odorless during application**

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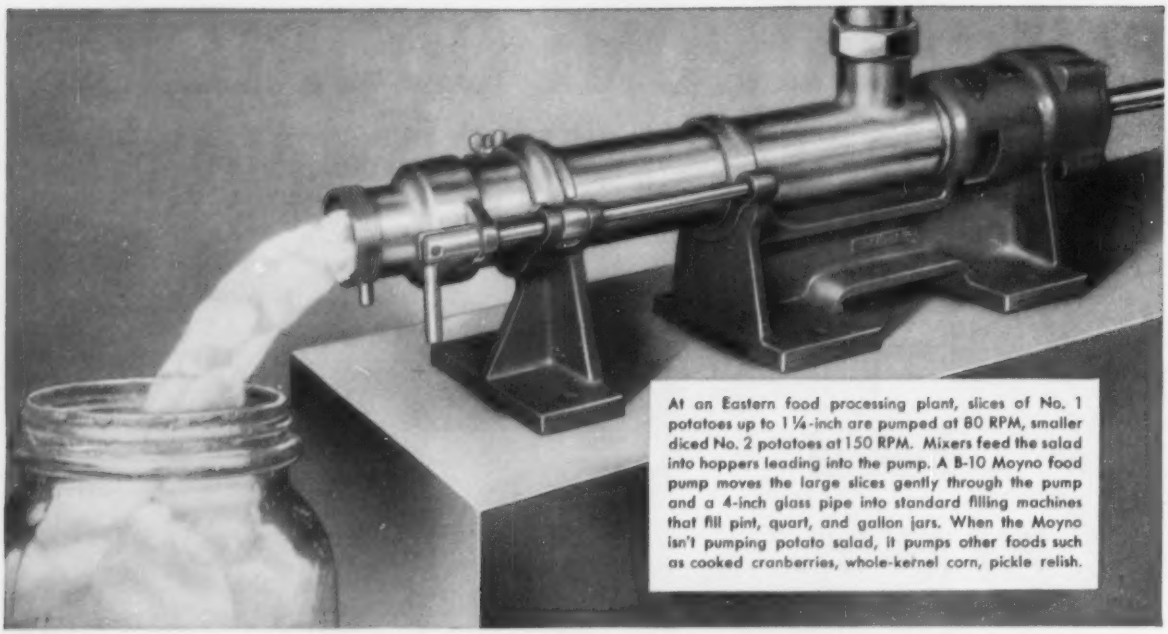


At an Eastern food processing plant, slices of No. 1 potatoes up to 1¼-inch are pumped at 80 RPM, smaller diced No. 2 potatoes at 150 RPM. Mixers feed the salad into hoppers leading into the pump. A B-10 Moyno food pump moves the large slices gently through the pump and a 4-inch glass pipe into standard filling machines that fill pint, quart, and gallon jars. When the Moyno isn't pumping potato salad, it pumps other foods such as cooked cranberries, whole-kernel corn, pickle relish.

This Moyno® Pumps Potato Salad With Slices Up To 1¼-inch...Without Crushing!

The Moyno can pump potato salad and a lot of other materials without making mush out of them—because of the unique *progressing cavity* principle.

Moynos have no valves and pistons, no vanes or other devices that cause churning and turbulence. The Moyno has a simple screw-like rotor turning within a double-threaded stator. This design creates cavities which progress smoothly toward the discharge end of the pump, carrying the material being handled. The material is not squeezed or churned.

Pumps Practically Anything

That's why the Moyno successfully handles such hard-to-pump materials as non-pourable pastes, frits, plaster, highly volatile liquids, and materials containing large particles, such as potato salad, fruit, cherries, chow mein—even oysters! In fact, the Moyno handles practically anything that will pass through a pipe.

Many Other Advantages

Moynos pump many hard-to-pump materials with a minimum of abrasion and wear. Many plants have adopted Moynos simply because they last so long.

Moynos provide positive displacement. Moynos can pull up to 29 inches vacuum while discharging under pressure. Big Moynos deliver up to 500 gpm; can provide pressures up to 600 psi in the smaller frame sizes. They even get up to 1000 psi momentarily.

The Moyno is reversible—it pumps equally efficiently in either direction.

With the Moyno, accurately metered flows are obtainable by regulating operating speed.

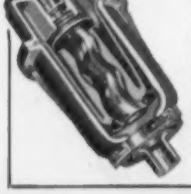
Moynos are trouble-free. They are self priming; won't cavitate or vapor-lock. There's just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain. Moyno pumps are easy to take apart for cleaning.

Write For Bulletin

You may save a good deal of money or solve a tough problem by finding out about this simple, versatile pump. Write for Bulletin 30FE.

HOW IT WORKS

Rotor is like a stretched-out corkscrew. It turns within a stator that has a double internal thread. Thus rotor and stator form closely fitted cavities. As the rotor turns, these cavities progress evenly toward the discharge end of the pump without closing up. That's why the Moyno easily handles materials without crushing, churning, or aerating; and why it can handle so many different things—solids in suspension, pastes, abrasives, highly volatile liquids, tars, soaps, caustics—even cement and plaster.



FOR DESIGN ENGINEERS

Moynos are available in small sizes and special designs for use in automatic washers, drink dispensers, sprayers, oil burners, machine tools, gasoline pumps, and a wide variety of other equipment. If you are designing machinery, we'll work with you, in confidence, to integrate pump design with your problem.

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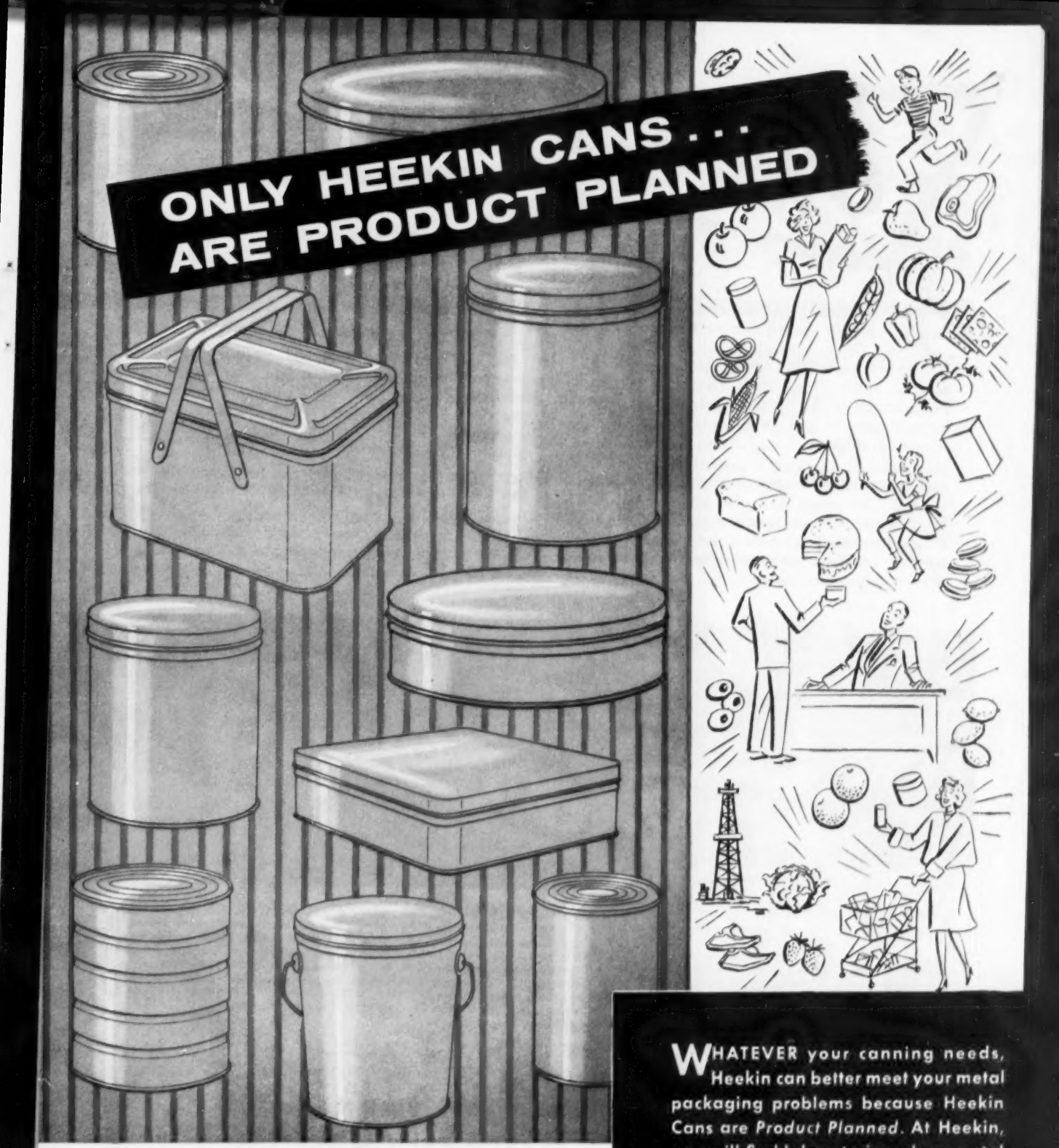
Fractional and Integral HP Motors | Desk, Window, and Household Fans | Hoists and Cranes | Moyno Pumps | Propellair Industrial Ventilating Equipment



Heekin PRODUCT PLANNED **cans**

THE HEEKIN CAN CO. *PLANTS AT CINCINNATI & NORWOOD, OHIO; CHESTNUT HILL, TENNESSEE; SPRINGDALE, ARKANSAS*

WHATEVER your canning needs, Heekin can better meet your metal packaging problems because Heekin Cans are *Product Planned*. At Heekin, you will find laboratories where metal packaging research is years ahead . . . in every field. You will profit by Heekin's fifty-four years of metal packaging experience. Heekin Cans . . . *plain or lithographed* . . . are product planned . . . planned for your profit.

Offering An Expanded Manufacturing

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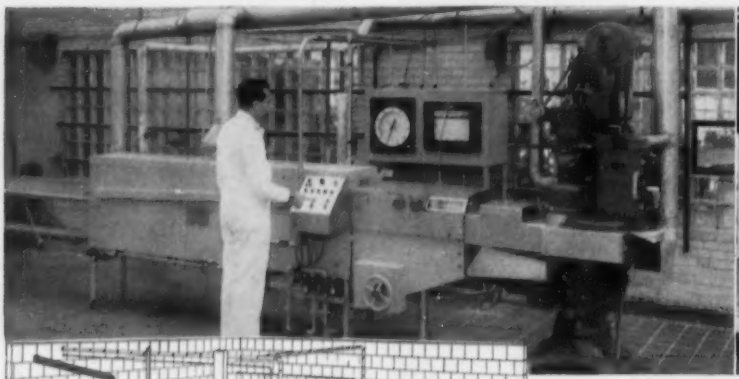
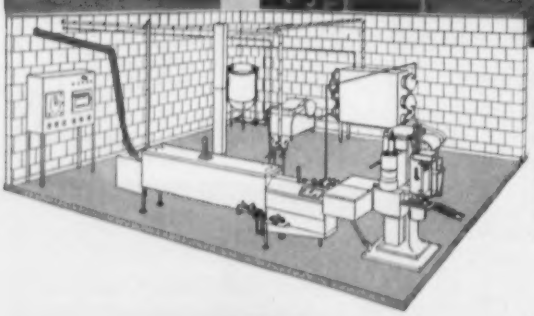
Now, Barnes offers an expanded program for the Food Processing Industry . . . a service that has been gradually developed during the past eight years. The five examples shown here are typical of the broad range of standard and special equipment that is today helping a number of processing plants to reduce work handling and cut costs.

Since modernization and mechanization of manufacturing processes has been a Barnes specialty, you'll find competent engineering counsel and complete, dependable facilities available to help you solve complex problems quickly.

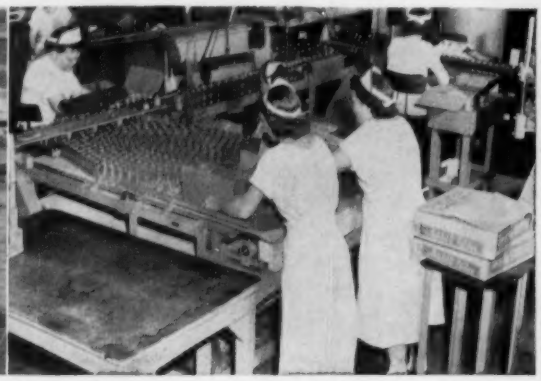
ASK FOR FREE ANALYSIS OF YOUR PROCESSING METHODS

Prepare now for even more competitive days ahead. Call in a Barnes Processing Equipment Engineer. He'll work with you in developing better cost-cutting methods and equipment.





DOLE ASEPTIC CANNING SYSTEM — A short-time, high-temperature canning method that permits speedy, continuous processing . . . guarantees higher quality, better flavor, color and texture of the product.



EMPTY GLASS SINGLE FILERS—Handle up to 600 jars per minute with practically no breakage. Design permits handling different sizes of jars. Semi-standard units available for odd-shaped jars or bottles; other units handle tin and glass interchangeably.

W. F. & JOHN BARNES

W. F. & JOHN BARNES COMPANY

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2 PROPOSALS AND COST ESTIMATES—Where new equipment is recommended, complete and detailed reports and a cost analysis are submitted for consideration.

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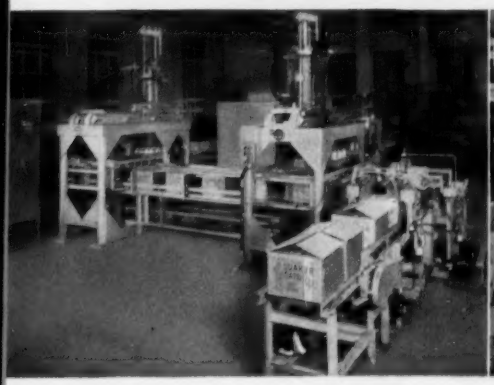
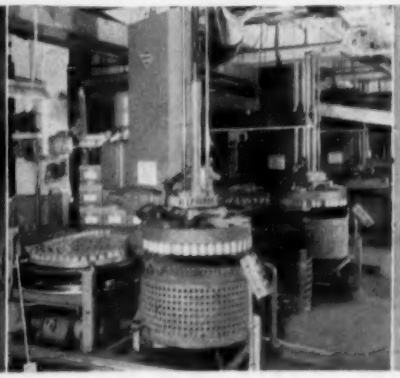
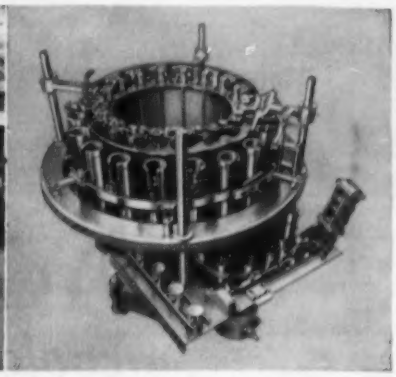
4 SPECIALIZED MANUFACTURING FACILITIES—A 75-year background and a large, well-equipped, efficiently tooled plant assure highest quality, dependable, cost-cutting machines and equipment.



CARTON UNCASERS AND RECASERS — High-speed, electro-magnetic equipment designed and built by Barnes to uncase, unscramble, count, pattern-form, and recase automatically. Unit above performs both operations. Individual units available to uncase or recase.



RETORT BASKET LOADERS AND UNLOADERS—Automatic hydraulic units for handling glass, round or square cans at speeds in excess of 600 per minute. Smooth, continuous automatic flow virtually eliminates glass breakage and dented cans.



NEW LIBRASCOPE FILLERS — For liquids and semi-solids. Fast, accurate filling in tin or glass containers. Engineered to cut maintenance. Built in Gravity, Gravity Pocket, Piston, and Bottom Fill Piston types. From 6 to 27 stations to meet your needs.

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- ☐ Empty Glass Single Filers
- ☐ Special Conveyors and Elevators.
- ☐ Retort Basket Loaders and Unloaders
- ☐ Carton Uncasers and Recasers
- ☐ Librascope Fillers
- ☐ We would like to have a Barnes Processing Engineer call at our plant.

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COMPANY _____

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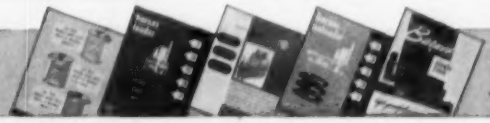

EQUIPMENT SINCE 1872

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His job is easier because his truck is cooled with **COLDMOBILE**

With Coldmobile, the driver has no sensitive controls to adjust. No defrosting is necessary. Truck temperature is automatically controlled to stay consistent even after many door openings. Cool air is continuously circulating throughout the truck to keep all meat, poultry or any perishable always fresh . . . constantly protected.

Coldmobile Units Are Truck-Powered for Big Savings Here's real economy! No separate engine or batteries are required for refrigeration. Maintenance for these "extra" units is eliminated, and truck refrigeration becomes the by-product of driving. Yet Coldmobile units operate at peak efficiency with little effect on fuel consumption.

Easy to Install, Easy to Maintain. Units are sealed at the factory. No oiling or greasing is necessary, for all moving parts have sealed-in lubrication.

Models for Stand-By Operation. Model L (wt: 350 lb.) operates only when truck is running. Model LE (wt: 550 lb.) has convenient plug-in for stand-by operation. Model Split LE (wt: 600 lb.) with plug-in for trucks of low body height. All units provide more BTU capacity per pound *than any other truck refrigeration unit.*

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This apple has a flavor which appeals because it's true and rich

Bite into a ripe, red apple. That's the taste Norda Apple gives you. Norda puts into apple what sunlight and Nature store up.

Norda nodes of *in-blown* flavor have enriched the flavors you'll use. They have new *in-grown* completeness, a new real-fruit quality. Norda skills are responsible.

You will find Norda's new *in-blown* flavors wonderfully adaptable. They are flexible to every one of your varying flavor requirements. You will save money with them.

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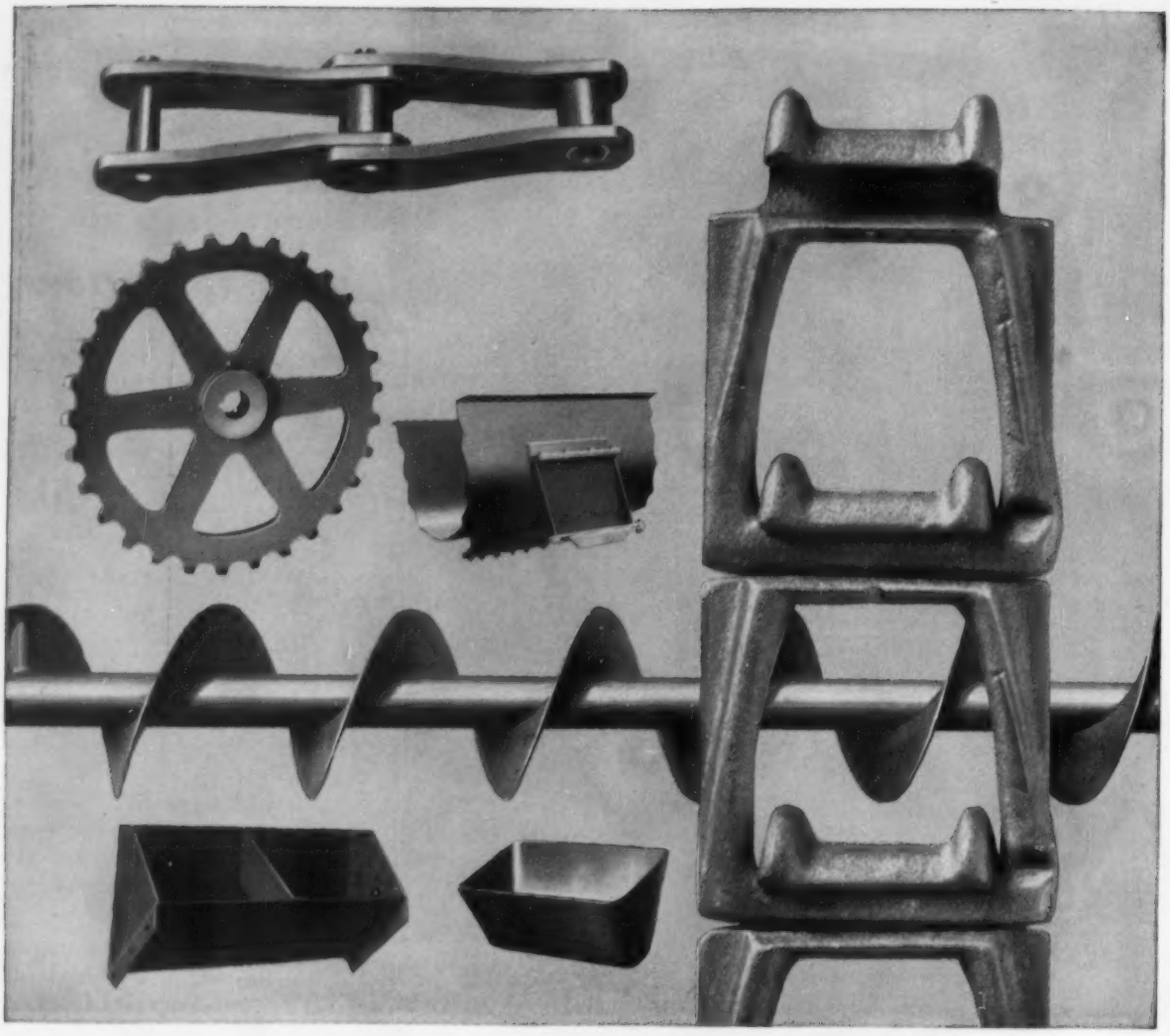

when your conveying job calls for

Stainless Steel . . . call for JEFFREY

Many companies make fine stainless steel. Jeffrey can fabricate this metal with a high degree of skill. Your materials handling problems calling for stainless steel are our specialty.

Experienced engineering and production personnel, plus special manufacturing equipment, enables Jeffrey to build entire handling systems, furnish standard conveyor units, or supply replacement parts in stainless steel.

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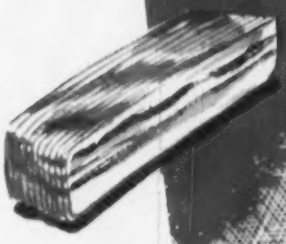
You can expect a stellar performance from every wrap we create. Why? It's because we know how to put quality into them every step of the way . . . . .



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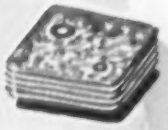
PACKAGING

. . . . . a quality that attracts consumers.

We think you'll discover that the day you chose **DANIELS** as your package supplier will be remembered as a "blessed event".



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VINEGAR, OIL *and* PIPE

Pfeiffer Food Products mixes vinegar and oil and secret things to create a fast-selling, especially-good salad dressing.

People have digestive systems equipped to enjoy the blend. A lot of pipe systems don't.

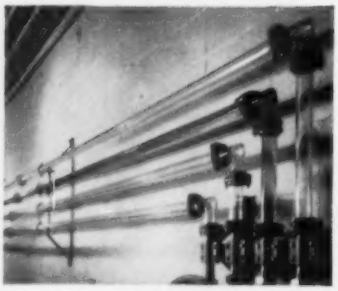
Vinegar eats away metal pipe—even corrosive resistant metal pipe. Oils find places to hide and cling and spoil.

Corrosion and contamination are expensive. But PYREX brand glass pipe isn't expensive—and it prevents corrosion and contamination.

Glass pipe refuses to be bothered by any food acids, hot or cold. Hard and smooth, glass denies slippery oils a place to cling.

Cleaning calls for a detergent, a rinse of steam or hot water or cold water. Cleaning goes on in place without down time.

Hundreds of food processors use PYREX brand glass pipe. They find it profitable. You will, too. To find out how much PYREX brand glass pipe can do for you, write, wire or phone for Bulletin EA-1.



You can mount PYREX pipe on walls or hang it as you would any pipe. It's easy to install.

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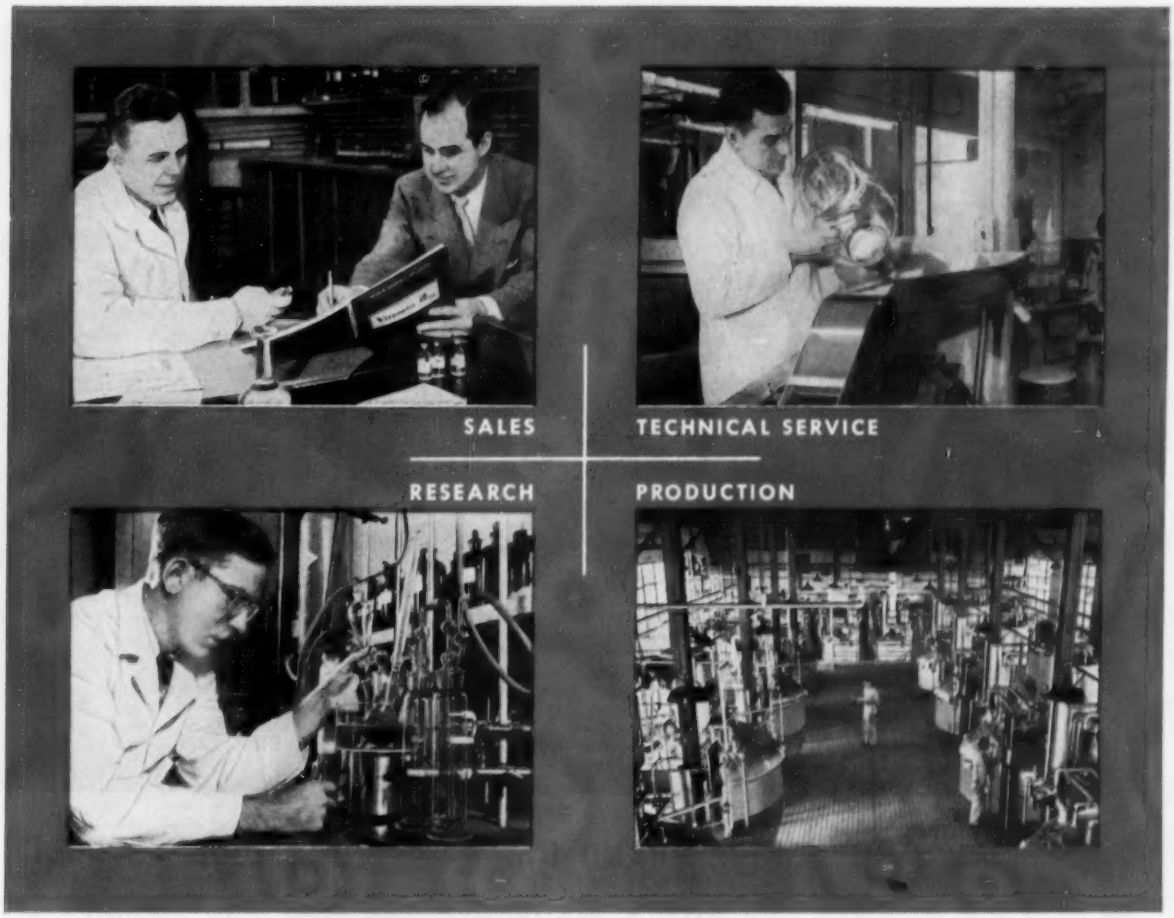
Corning means research in Glass



Use these specialists to create

NEW PROFIT OPPORTUNITIES

Today's consumers are nutrition-minded and open-eyed, yet cost conscious. To survive under these circumstances, a food product needs to offer something *extra*. If you are developing a new product, or must cut production costs on a staple, it will pay you to call in the Merck team. Here's what they have to offer:

SALES—Individual Merck representatives are specialists in cereal chemistry, vitamin technology, baking technology, meat packing, freezing, canning, and bottling. Through well-developed team play, your problem gets to the right man fast.

TECHNICAL SERVICE—The Merck technical service staff knows the food industry from albumin to zwieback. In addition, it can bring the Company's entire technical and scientific resources to bear on problems relating to the developing, manufacturing, analyzing, or labeling of food products.

RESEARCH—The Merck staff of research chemists is one of the country's largest. From this creative group have come major discoveries in vitamins and other scientific developments—with many practical and potential food applications. Merck customers, of course, are the first to enjoy these advances.

PRODUCTION—Merck is the world's foremost producer of vitamins and a major source of fine chemicals for the food industry. Through the years customers have come to rely on the purity, uniformity, and dependability of every Merck product they buy.

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STANDARD SANITARY PUMP

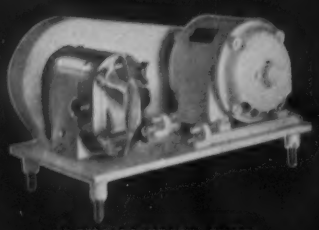
Due to the slow speed, positive action of the Waukesha pump, your food products are pumped out as they go in, without damage or waste.

VENTED COVER PUMP

Offers built-in protection against dangerous line back pressure. Easily adjusted for back pressure. Stops product flow if pressure exceeds safe pre-set limits.

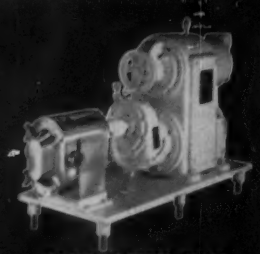
WAUKESHA HIGH BOY

A wise choice when a V-belt drive is needed —or wherever periodic speed changes are advantageous. Smooth, streamlined base. Cover fully splash-proofs the pulleys and belts.



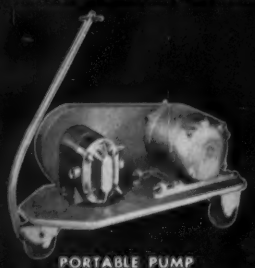
V-BELT SANITARY PUMP

Compact design with steel base plate and adjustable legs with ball feet for floor clearance and sanitation. Efficient, sanitary.



VARIABLE-SPEED PUMP

Ideal wherever a variation in capacities is required while pump is in operation. Accomplished simply by turning a hand wheel.



PORTABLE PUMP

A versatile unit. Can be moved easily to any part of the plant. Rugged construction. Available in gear head and V-belt models.

Typical of the complete line of Waukesha pumps for the food industry

Protect YOUR BRAND NAME and YOUR FOOD PRODUCTS with a WAUKESHA Sanitary P.D.* PUMP!

SIZES—Waukesha pumps are available with inlet and outlet ports from 1" to 3" diameter.

CAPACITIES—Pumps are available in a wide range of sizes from 1/10 to 100 gallons per minute; from 20 pounds to 60,000 pounds per hour.

HEAD PRESSURES . . . up to and including 100 pounds.

FABRICATED from corrosion-resistant "Waukesha Metal" or stainless steel, depending upon the application.

FOOD PRODUCTS—pumps such typical food products as: vegetable and meat soups, fricassees, creamed soups, jams, jellies, preserves such as cherries or strawberries (without crushing), pie fillings, baby foods, chocolate, catsup, mayonnaise, syrups, citrus fruit juices, prunes, custards, vinegar, vegetable oils, apple pulp, cooked carrots and many others.

*Positive Displacement

● This pump does not macerate delicate food products or cause spoilage. Instead it preserves the structure, appearance, and goodness of the food. The secret is the slow speed, positive displacement action. The Waukesha pump handles equally well all kinds of food in solution—light liquids, creamy soups, semi-solids, and chunky mixtures. It is a versatile pump—can be used for many food pumping jobs.

The Waukesha pump is a sanitary pump . . . easy to disassemble, wash, sterilize, and reassemble. Saves many hours of cleaning time. The secret is the exclusive Waukesha Sanitary O-Ring Seal. It completely seals your product in . . . completely seals out air.

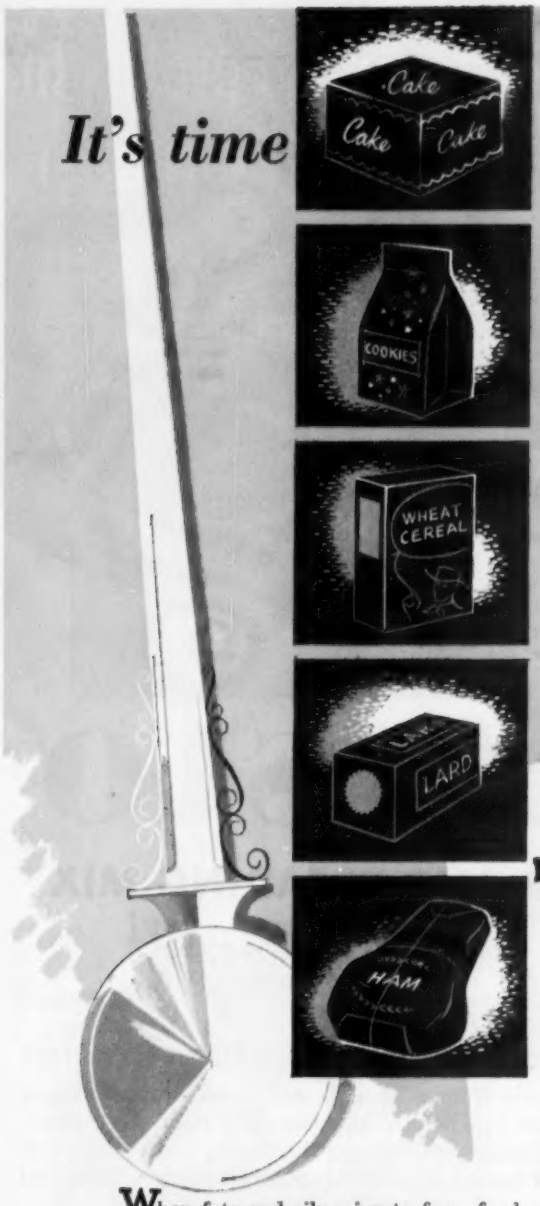
Made from corrosion-resistant metal, the Waukesha pump will not contaminate the food or impair its flavor. A complete line of pumps is available for your plant.

Write for Complete Pump Information

WAUKESHA FOUNDRY COMPANY, Dept. 10A, Waukesha, Wisconsin

Waukesha Foundry Company

WAUKESHA — the Forward Look in Pumps. Yesterday, Waukesha Pioneered the Sanitary P. D. Pump. Today, Waukesha Pioneers the Improvements.



It's time ...to ask your suppliers for IONOL®, C.P. *impregnated packaging...*

newest, low-cost way to protect foods against oxidative spoilage

When fats and oils migrate from food product to box or wrapper, they rancidify quickly, causing deterioration of flavor and aroma.

The effective way to combat this serious threat to product shelf life is to incorporate Ionol, C.P.—a most efficient antioxidant—into the boxboard or wrapping material. Rancidity is then stopped right where it begins, at the *surface*.

In actual tests, baked goods stored at 85°F in Ionol, C.P. impregnated boxboard cartons, were free of rancidity at the end of ninety days. Without Ionol, C.P. protection, baked goods stored under similar conditions, often develop rancidity within a week.

When your food products contain fats or oils, Ionol, C.P. impregnated boxes or wrappers will greatly prolong shelf life. Additional protection can be assured by using Ionol, C.P. as a direct ingredient in your food products.

Ask your packaging materials supplier for this modern way to protect the good name of your brand label. Write to Shell Chemical for names of suppliers of Ionol, C.P. impregnated packaging.

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Pick-up more profits in BREADED items!

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BATTER AND BREADING MIX

COOKS CRISP! STAYS CRISP!

Fries, Broils, Bakes a Golden Brown!

KRUSTO is made from a "crumb loaf"—not ordinary bread crumbs—baked by Griffith. We bake it of hard wheat, salt, seasoning and milk—without any shortening—to avoid risk of developing off-flavors, and to assure its wholesome taste and crispness.

Any KRUSTO Batter and Breading Mix offers you . . .

- ★ **Improved pick-up and adhesion** (sealing in the flavor juices)
- ★ **Less blistering or puffing**
- ★ **Longer lasting crispness**
- ★ **Lower fat absorption**
- ★ **Better controlled color development** (fry, broil or bake a golden brown)

Free SAMPLE OFFER!

Every KRUSTO Mix is formulated for use on specific fresh meats (fish and fowl), to be cooked in a definite way to develop a desired golden brown color. To request sample simply write your name and title on company letterhead, and describe product which is to be breaded with quality controlled KRUSTO.

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In Canada—The Griffith Laboratories, Ltd.
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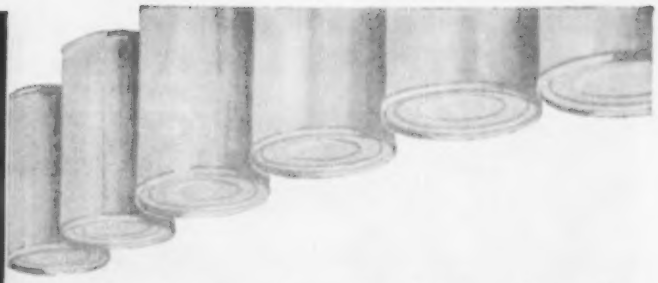
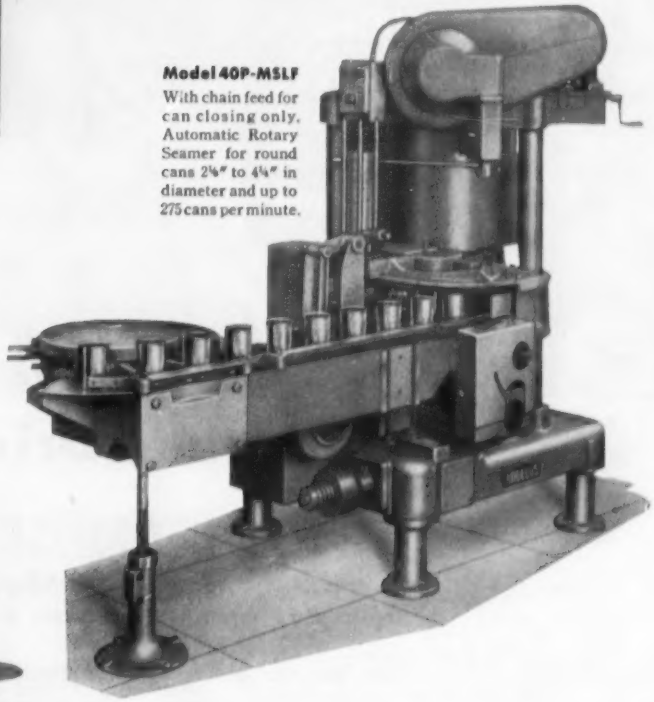
cut costs with Angelus Seamers



More canners and can manufacturers throughout the world are switching to Angelus Seamers for greater production economies, lower investment costs and minimum maintenance. Angelus Seamers, the products of more than 40 years of experience in developing and manufacturing, are the ultimate in simplified, rugged, efficient design.

Model 40P-MSLF
With chain feed for can closing only. Automatic Rotary Seamer for round cans 2⅛" to 4¼" in diameter and up to 275 cans per minute.



Model 40P-DF
For can closing and can making. Automatic Rotary Seamer with disc feed for round cans 2⅛" to 4¼" in diameter and up to 275 cans per minute.

Investigate the advantages of low cost production, low cost investment, and low cost maintenance with Angelus Automatic Seamers.

Write today for complete details on models and an Angelus Engineered Application Recommendation.

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Sanitary Can Machine Company

Cable Address "Angelmaco" Western Union Code
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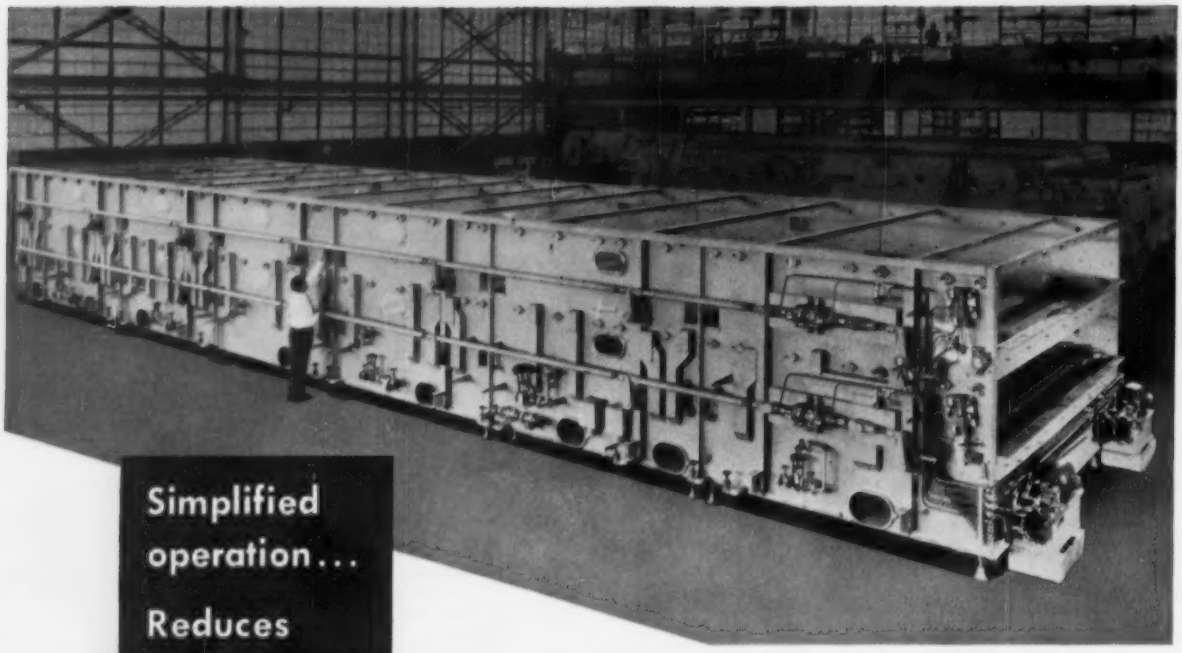
LOOK...NO CHAINS! no cams...no gears



Simplified operation...

Reduces maintenance

The *B-W VORTEX* Processor Hydraulic Drive

For smooth, dependable pasteurizing, cooling, freezing or exhausting, the Vortex is powered by a wear-free cushion of oil. This simple but rugged hydraulic unit drives the "walking beam" conveyor. Downtime for repairs and maintenance is practically nothing.

The "precision processing" made possible by the Vortex protects the quality of your products . . assures complete uniformity . . . prevents spoiled batches. Even with unskilled workers, the simple and accurate automatic controls of the Vortex assure dependable quality control.

These are just a few of the features behind the fast-growing popularity of Vortex processors in the food industry. For complete information and technical bulletins, write:

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Duraface* FOAMGLAS

the cellular glass insulation and integral finish

This is a pharmaceutical tablet drying room recently completed by SCHERING CORPORATION at their Union, N.J., plant. They picked new Duraface FOAMGLAS to insulate and finish the walls in one operation. They say: "These remarkable cellular glass blocks give us dependable insulation plus an attractive and durable finish that we can wash down as often as necessary."

Tough, waterproof Duraface FOAMGLAS insulates and finishes these walls

One material, erected in one operation is both insulation *and* finish for the walls you see above. It's *Duraface* FOAMGLAS . . . the remarkable cellular glass insulation intra-fused with a hard white crust of denser sealed cells.

This unique new product gives you all the important benefits of long-lasting, high-performance cellular glass insulation PLUS an integral finish that:

- **can't peel or separate!**
- **is safely and easily washed because it's waterproof!**
- **is fireproof and vermin-proof!**
- **takes greater impacts than standard applied finishes!**

Find out today how you can solve *your* insulation and finish problems with one material . . . *Duraface* FOAMGLAS! Write us for a sample and descriptive folder.

Pittsburgh Corning Corporation

Dept. O-105, One Gateway Center
Pittsburgh 22, Pennsylvania

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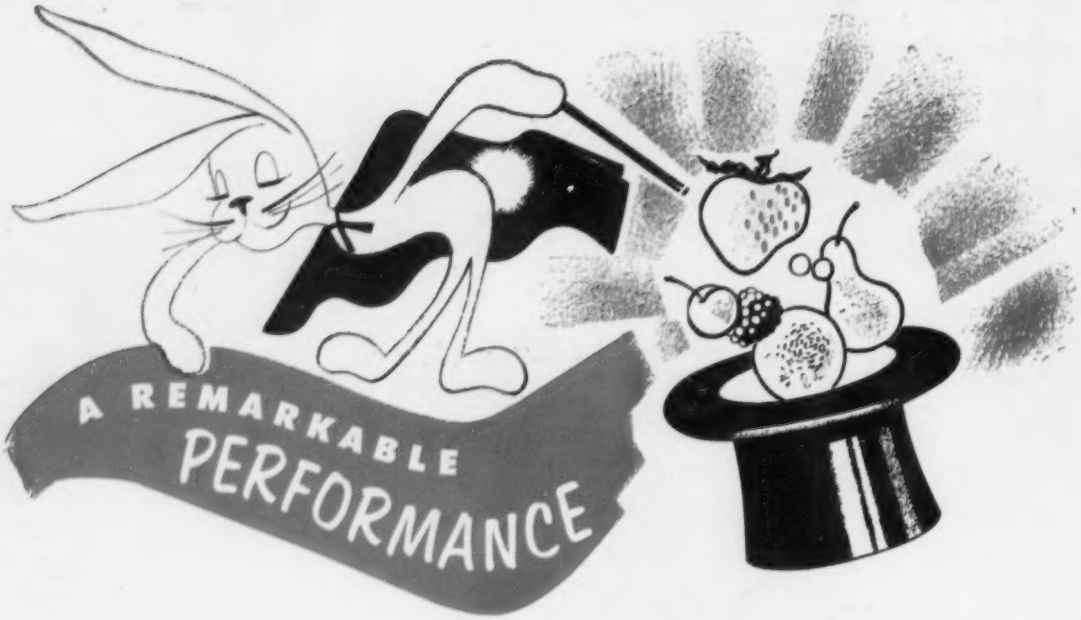
*A trademark of Pittsburgh Corning Corporation

New Duraface FOAMGLAS is completely waterproof. You can scrub it or hose it down without impairing its high insulating efficiency.



★ **The SEALVA process hermetically seals flavors, even those with the most fugitive and delicate components, against the deteriorating effects of aging and oxidation. Droplets of liquid flavor are completely sealed in an inert, edible gum film forming a dry powder. The completely protected flavor is released only in the mouth or in water.**

SEALVA flavors have been enthusiastically accepted in almost every branch of the flavored goods field.

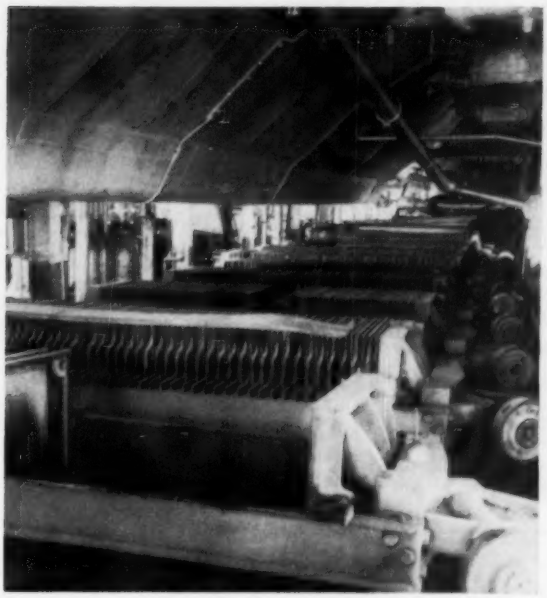
In GELATIN DESSERTS, far superior flavor quality is possible without regard to aging. In CONFECTIONS of the pressed type, flavor permanence is assured. In MIXES and DESSERTS, problems of oxidation and evaporation no longer exist. As DAIRY MIXES, SEALVA flavors offer unbelievable possibilities. In PHARMACEUTICALS, SEALVA flavors find their widest acceptance.

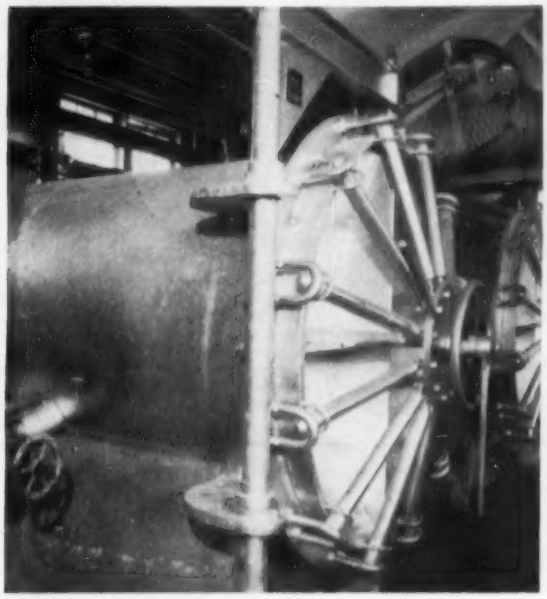
Wherever permanent flavor perfection is desired in dry form, SEALVA is the answer.

Tell us your product, your problem. Send for samples and literature.

VAN AMERINGEN-HAEBLER, INC.
521 West 57th Street, New York 19, N. Y.

★ Alva FLAVORS





FROM OLD 11 TO NEW 5—FOR $19,000 SAVING

YESTERDAY: Eleven plate-frame presses were used to filter thick juice at Holly Sugar's Santa Ana plant.

TODAY: Five new leaf-type "self-sluicing" units handle the job with ease, save company $19,000 yearly.

Self-Sluicing Unit Points Way to

"Pushbutton" Filtration

With all filter-cloth operations and "take-apart" chores eliminated, cleaning down-time plummets from tedious hours to mere minutes—meaning manual labor is virtually abolished

G. W. COSSAIRT

Assistant Superintendent, Holly Sugar Corp., Colorado Springs, Colo.

Through adaptation of newly designed filtering equipment coupled with progressive engineering, numerous big benefits have been brought to the Holly Sugar Corp. at its Santa Ana, Calif., plant.

Outstanding among these are—

1. Production of a more uniform, better quality filtrate.

2. Savings in labor and materials—estimated at about $19,000 for the 1955 campaign.

3. Tripled filtering rate per sq. ft. of area—7.9 gph./sq. ft. as against a previous 2½ gph.

4. Reduction in filter time cycle.

5. Higher-density thick juice handled.

6. Bright promise of achievement of full pushbutton filtration.

Mainly responsible for these benefits is a brand new filter. This is the Auto-Jet (United States Filter Co., Arcadia, Calif.) a completely enclosed unit offering a high degree of cleanliness and sanitation.

Filter and Its Operation

It comprises a horizontal welded steel tank or shell. Inside, mounted vertically on a hollow central shaft, are a series of 22 leaves, providing 500 sq. ft. of filter area.

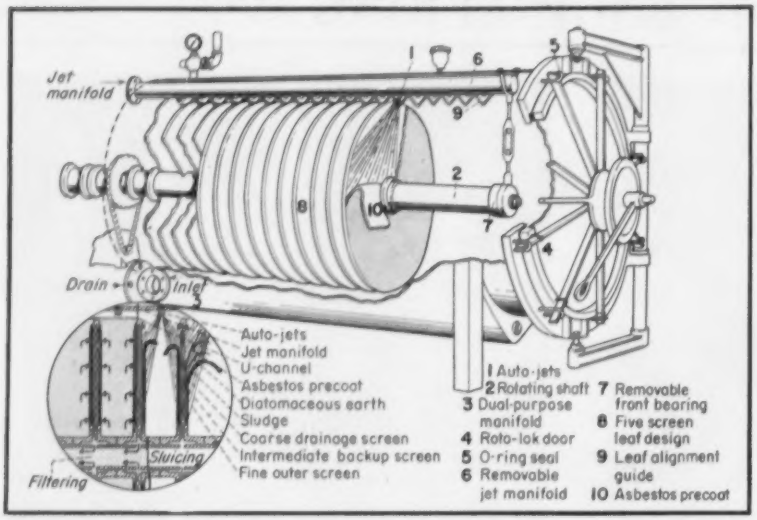
Made of Monel, the leaves are of 5-screen design. The center, heavy 1-mesh screen provides rigidity and serves as the drainage channel. It is covered on both sides by two 8-mesh wire back-up screens. These provide proper support to the two 60-mesh .011 twill outer covering filter screens.

Screen structure is firmly attached to a heavy cast Monel hub which, in addition to the leaf alignment-guides affixed to the jet header, insures accurate 3-in. leaf spacing. The outer, peripheral edge of the leaf is a specially formed U-channel that further increases leaf rigidity.

All-Monel construction prevents electrolysis and corrosion. And should a scaling condition arise, it permits use of acid without detrimental effect.

Thick-juice enters side of filter tank through an inlet manifold, baffled to

A Look Inside the Unit . . .



CUTAWAY VIEW of Auto-Jet filter. Inset lower left: How it operates during filtering cycle, and how pressure sprays from jets sluice deposits from screen surfaces during cleaning.

SPECIFICATIONS
U. S. Auto-Jet, No 600 W/500 sq. ft.
Capacity: 150 gpm. max.
Total weight: 8 tons.

TANK
Dia. 54 in. Height 7 ft. 3 in.
Length 11 ft. 9 in. Width 5 ft. 5 in.
Volume 1,150 gal.
Working pressure 0-50 psi.
Drive motor 1½ hp. Speed 3 rpm.

LEAVES
Dia. 48 in.
Area 22.4 sq. ft. each.
Number 22. Area 500 sq. ft.
Interspacing 3 in.
Interchangeable.
Weight of each 55 lb.

SCREEN DESIGN
1-mesh .120 wire (center).
Two 8-mesh .028 wire (backup).
Two 60-mesh .011 wire (outer).

JETS
Flow—15 gpm. (any clear liquid).
Pressure—50 psi.
Sluicing arc—65 deg.
Sprays—dual.

provide a flow through both sides of each leaf. This well-distributed flow develops a uniform cake thickness over the entire filter areas. Filtrate flows through the channel formed by the 1-mesh screen, through the hollow hub, and thence through the center shaft to the discharge. Leaf rigidity and free drainage are dominant factors in this design.

For cleaning, a header is mounted at the top of the filter shell with dual jets that sluice adjacent sides of two different leaves. Sprays are controlled to a spread of 65 deg. and impinge on the screen in a concentrated arc between hub and rim. When sluicing, leaves are rotated slowly (3 rpm.), by means of a 1½ hp. motor. Header is easily removed for inspection of jets.

Breaking With Tradition

Successful use in filtering liquid sugar syrups (up to 77 deg. Brix) led to consideration of these new leaf-type units for "thick-juice," (65-73 deg. Brix).

But here, operating conditions are quite different from those faced in filtering finished liquid sugar syrups. Where the latter are of very uniform density and contain negligible, if any, suspended matter, thick juice is of significantly varying composition. Pressures are generally uniform in liquid sugar filtration, whereas, in the refining process, pressures have been quite irregular. Temperature variations, too, have significant effects on filtering.

Furthermore, solids suspended in the thick juice are compressible in nature and seriously affect filter cake permeability. Solids conditioning is thus essential.

For decades, plate-and-frame presses have served as the work-horses at this station. But, while they are low in first cost, their labor and filter media requirements are high.

Of less importance, yet of some significance, is the fact that this station has been one of the limiting factors of the process. It has adversely affected the overall heat balance, limited the degree Brix of thick-juice to be filtered and, in turn, of the filtrate, which affected white (vacuum) pan efficiency.

In an attempt to overcome these difficulties, a four-year experimental project was set up at our Santa Ana factory. Objectives were to: (1) Produce a thick juice of better and assured quality; (2) reduce operating costs, and (3) develop a clean, easily sanitized station.

At the outset of the project, objectives as well as major problems were known. Not only were the engineers concerned with the selection of a new type filter that would successfully clarify thick juice of varying composition but, also, with design of equipment that would provide a continuous flow at uniform pressure and temperature.

Evaluation Tests

Simultaneous, full scale comparative tests were conducted on both leaf-type and plate-frame filters. They indicated that, if equivalent filter media were applied to each of the two units, each would yield filtrates of identical clarity. Also, each filter would be equally affected by changes in thick-juice viscosity, compressible solids, pressure, etc.

Major questions concerning use of the Auto-Jet were: (1) Could reliable precoat filter media be hydraulically applied that would be the filtering-equivalent of the double-thickness cotton duck or twill cloths used on plate-frame units, and (2) could the cake and precoat be sluiced off with complete assurance of the leaves' cleanliness for the start of the following cycle?

Four-year's experience with a test filter demonstrated that an equivalent filter media could be easily and reliably applied and that, by modifications, complete sluicing could be accomplished without need of visual inspection.

These tests culminated in replacement of 11 plate-frame units by 5 jet filters of improved design.

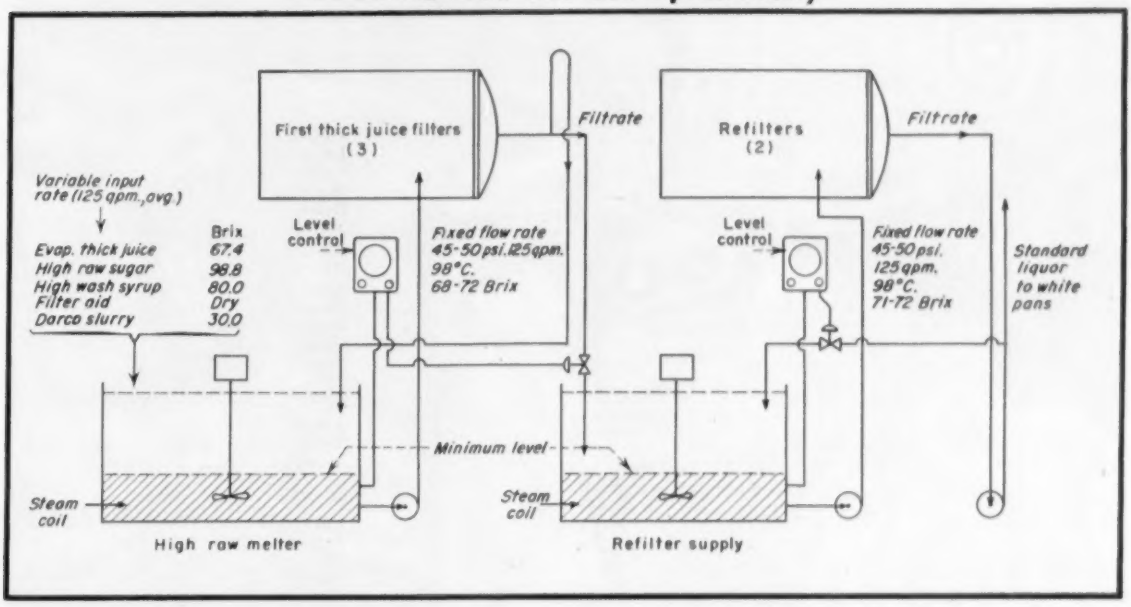
Applying the Precoat

With these units, pushbutton application of filter media is a near reality. All one has to do is to start a pump, make a valve change, and the precoat is automatically applied to the surface of the leaves.

The filter medium, a blend of asbestos and sulfite pulp, is combined with diatomaceous earth and mixed with filtered thick juice to form the precoat slurry.

The fibrous mixture is then circulated through the shell by a special pump. Within 3-5 min. the coat is applied. It lies flat on the screens and rapidly interlaces to form a tight but porous mat.

. . . And How It's Set Up at Holly



SCHEMATIC of thick-juice filtration station at Holly Sugar Corp.'s, Santa Ana plant. Note location of new leaf-type filters that automated the operation, and level controls that eliminated fluctuations in supply.

Total down time is about 10 min. During this short period, the other filters are capable of handling the flow of thick juice.

This seemingly simple operation is the key to successful filtration in the new leaf filter.

Amount of asbestos in the fiber mixture largely determines permeability of the precoat, and thus the ultimate clarity of the filtrate. A reliable mix has been 7½ lb. of No. 80 asbestos (80% asbestos, 20% bleached sulfite pulp), and 50 lb. Speed-plus filter aid. Both are mixed with about 150 gal. of filtered thick juice.

At first, most of the filter aid passes through the screens, leaving asbestos fibers on the leaves. As the flow continues, however, the asbestos mat becomes dense enough to hold back the filter aid. As the cake builds up it retains the finely divided activated carbon, mixed in the thick-juice feed.

A circulation rate of 500-600 gpm. is used. The precoat is thus applied in a very short order and, at the same time, the juice within the shell is kept well mixed. Also, as the precoat is being established, it is thoroughly scoured to remove loosely held particles. This minimizes subsequent leakage due to fluctuating pressures. Excellent clarity of filtrate is attained in 8 min. and the filter then is valved back to the line.

Experiments indicated that a flow rate of 7-8 gph./sq. ft. provided optimum, practical balance for blending, solids conditioning, clarity, and production of a 67-70 Brix standard liquor filtrate.

Sediment tests indicated that fluctuating pressures of the feed slurry had adverse effects on filter efficiency and clarity of filtrate.

To provide constant pressure and uniform flow, a feed and recirculation system was devised. This system is now in use in other company plants having plate-frame filters.

Process Pinpointed

One of the first factors of importance is the station's actual throughput. To clearly describe the significance of this performance data it is necessary to recount some of the processing details.

Thick juice (sometimes called "blow-up juice") is composed of filtered juice, high raw sugar, high wash syrup, filter aid, and Darco (activated vegetable carbon), all blended manually. It is pumped to the high raw melter, where temperature is adjusted to 98 deg. C. An agitator keeps the material in suspension.

The two supply tanks (high raw melter and refilter supply) are equipped with steam coils to maintain this temperature.

Of the five filters at this station, three are used for first thick juice (1,500 sq. ft. filter area), and two (1,000 sq. ft. area) for refiltering. Final filtrate, now standard liquor, is drawn by vacuum into the white pans.

To provide a constant supply of juice for this system, filtrate may be returned to the supply tanks, or drawn to the white pans. Pressure regulated valves, controlled by two liquid level instruments, control the recirculation to melter tanks.

Thus, if process flow is restricted, the controllers maintain at least a minimum level in the feed tanks. This assures a constant 45-50 psi. supply to the pumps feeding the filters.

Self-Cleaning Feature

To clean a filter, a valve change stops filtration and drains the contents of the shell back to the filter supply. A second valve change is made and the sluice pump starts, supplying thin juice at 50 psi. Although the cake is usually removed in less than 2 min., a period of 3 min. is normal to assure perfectly clean leaves.

The spray literally peels off the cake. It drops to the trough-like bottom of the filter tank, where it is rapidly slurried and drained to the carbonation filter feed tank (Oliver). Use of thin-juice prevents dilution. Including valve changes, sluicing is completed in 4 min., and the precoating cycle starts immediately. Relatively small volumes of liquid are required (about 1,000 gal.) to sluice the filters.

Total sluice and precoating time is 20-25 min., compared to about 2 hr.

(Turn to page 204)

USING HANDY portable fumigator and compressed air from mill outlets, low-dosage short-time fumigant is injected through ¼-in. pre-bored hole in this roll stand at the Russell-Miller plant.

BETTER SPOT-FUMIGATION

—*With Only One-Third the Labor*

Midwest miller applies simple, more effective method that requires but two men for 4-hr. coverage of 800 plant points . . . Saves on fumigant and abolishes old annual general treatment of machinery and facilities

First in a Series of Three Articles*

PAUL WAGNER and L. E. McQUILLEN

Respectively, Milling Superintendent, Russell-Miller Milling Co., Alton, Ill., and Vice-President, Ferguson Fumigants, Inc., Ferguson, Mo.

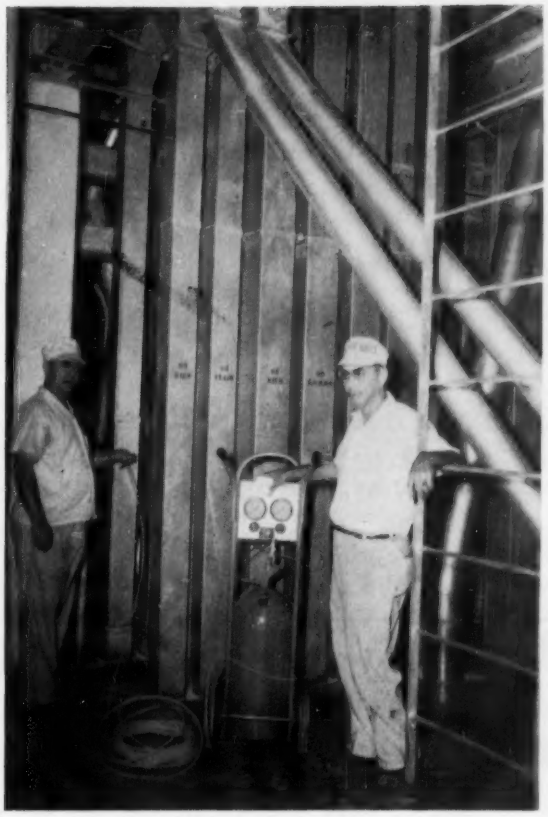
These five striking benefits are being marked up by the simple spot-fumigating technique adopted at the modernized 550-cwt.-per-hr. flour mill of Russell-Miller Milling Co. in Alton, Ill.—

- **Big slash in labor costs.**
- **Large reduction in amount of supervision by mill superintendent.**
- **Significant cut in volume of fumigant manually handled.**
- **Great improvement in preventive insect-control measures.**
- **Fewer hazards to workers.**

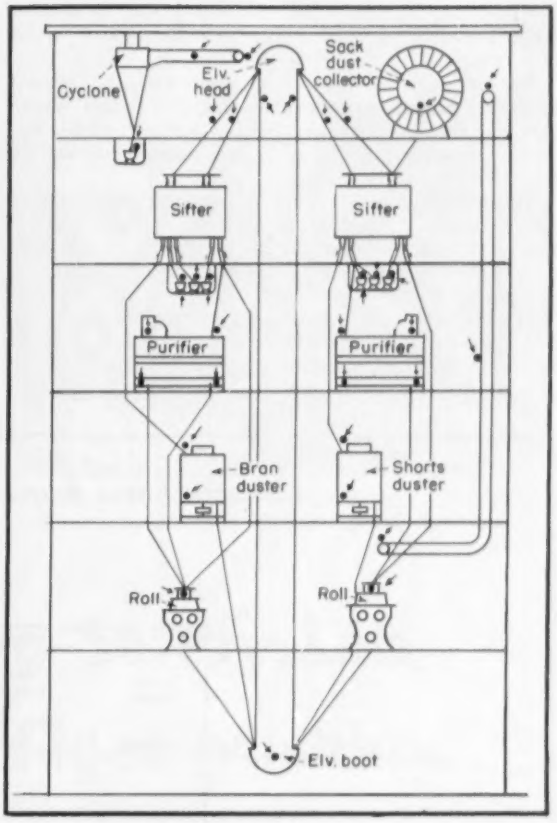
Where formerly six men were required for the 4-hr. spot-fumigation of 800 points in the mill, with the new system only two men are needed to do this job.

What's more, it used to taken an additional two men a full day to trundle out the formerly employed 55-gal. drums

* Central fumigation and safety engineering of the fumigation system will be topics of the second and third articles of this series, to be carried in forthcoming numbers of FE.



JIFFY 2-MAN treatment is given bucket elevators. One operator inserts nozzle, second man presses control button.



TYPICAL POSITIONS of pre-bored ¼-in. holes for injecting fumigant are indicated in this milling-plant drawing.

of fumigant and dispense it into whatever small bottles were on hand—and at the risk of considerable exposure to fumigant.

Bottles were then distributed over six floors, with contents then poured through into machinery and other facilities. Empty bottles then had to be collected for re-use.

The six workers thus saved by the present highly efficient fumigating system have since been assigned to simpler, more pleasant, and hazard-free inspection and sanitation chores.

Today, their more frequent cleanups of accumulated cereal dust throughout the mill prevents insects accidentally brought into the mill from going through their life cycles and, thereby, infesting flour, machinery, and other production facilities.

Moreover, the milling superintendent has got needed relief in his supervisory duties, since the new system is easier and the fumigant less hazardous to employ. Now, the two operators merely carry out simple routine tasks, with elimination of the old "get-ready" and post-fumigation chores.

Fumigant formerly employed comprised a mixture (volume basis) of 25% of carbon tetrachloride and 75% of ethylene dichloride, to which was added 15% of ethylene dibromide. About 150 gal. had to be employed for each fumigation. And this didn't accomplish quite as effective an insect kill as is now scored with 15 gal. of the new fumigant—Dawson Formula 73.

This new killer contains (by weight) 70% of ethylene dibromide and 30% of methyl bromide. It is a low-dosage, short-exposure synergistic fumigant supplied by Ferguson Fumigants, Inc., Ferguson, Mo.

From a materials and labor standpoint, the former technique was further costly in that the mill machinery and facilities had to be treated every second week. In addition, the mill always had to be shut down for an annual 3-day general fumigation with a 2,000-lb. shot of methyl bromide.

Traits and Action

Now, however, the new fumigant is applied only every three weeks during summer and every four weeks during winter months—achieving an overall yearly 50% reduction in cost of fumigant. And because of the efficiency of the present system, general fumigation has been abolished.

Positive preventive control has been significant, for the new, extensively diffusing fumigant thoroughly penetrates the mill stock. It is its high toxicity to insects that reduces

Another miller wanted to see . . .

. . . exactly how the new system would compare with the old in performance in his plant. So during regular fumigations he placed test boxes of insects in many locations to determine effectiveness of kill with both old and new techniques.

Further, he kept full records of costs of materials and labor.

Subsequent report: The new method of low-dosage, short-time fumigation slashed labor charges about 80% and reduced fumigant costs over 20%. And examination of the test boxes revealed a superior kill.

the frequency of fumigation. And tendencies to re-infestation are greatly delayed because of residual effect of this new fumigant.

As for reducing hazardous conditions, the present method is carried out in a totally enclosed system. Fumigant, too, is non-flammable, and has a strong, readily recognized odor (detected in 20-50 ppm. concentrations) and no inert carriers.

The technique involves use of a concentrated fumigant and a simplified method of applying it. The portable fumigator, called "Little Squirt" (Ferguson) is composed of a 5-gal.-capacity cylinder mounted on a rubber-tired, 2-wheel hand truck.

Hooked up to the cylinder is a 100-ft. length of polyethylene tubing with a small copper nozzle at the end to fit into ¼-in. holes bored into equipment. Unit uses air pressure from outlets on each floor.

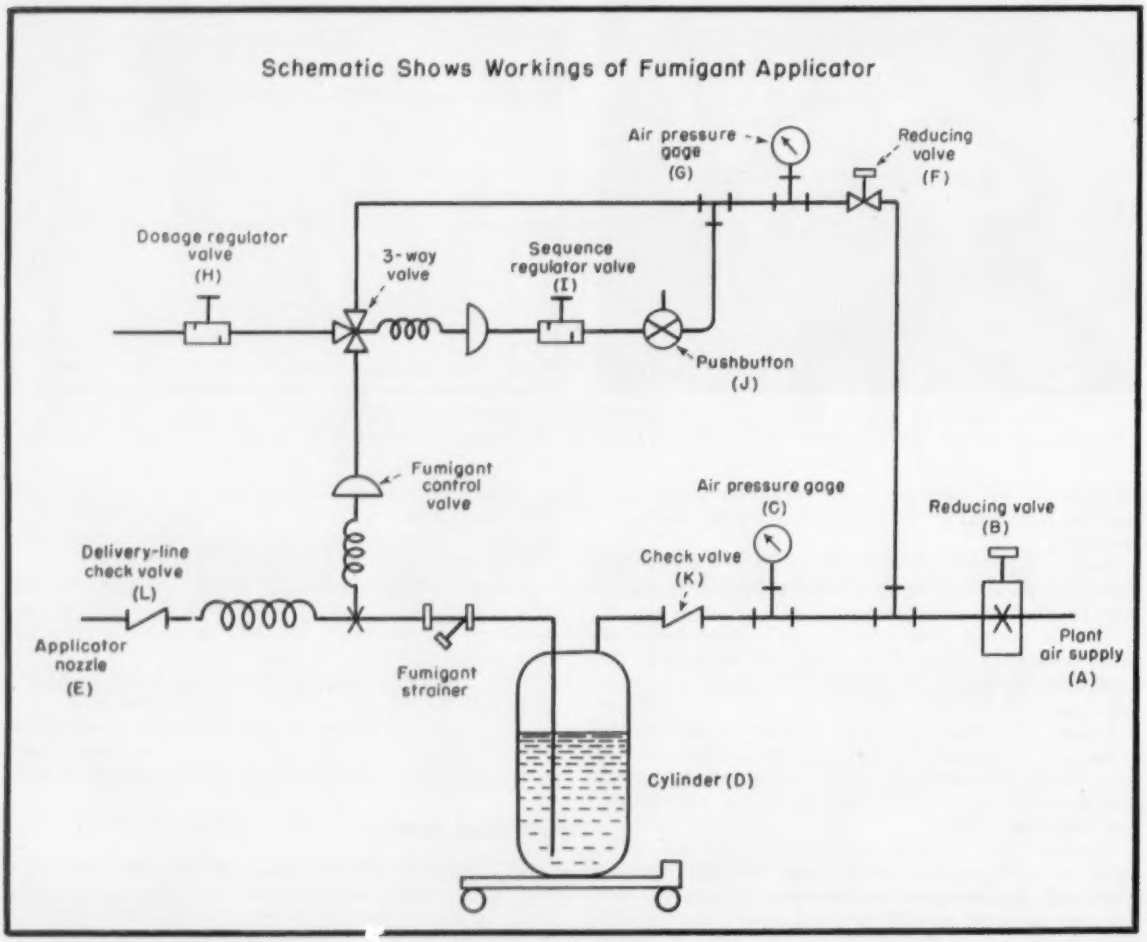
Steps in the method: Two men operate the applicator. One inserts the nozzle in the aperture in the milling equipment, and next signals the second man to release a 2-oz. dose of the highly concentrated fluid fumigant.

Second operator merely presses a button on the fumigating machine. The measured amount of fumigant, pre-set on the machine, is released by air pressure through the nozzle. Flow is then automatically shut off. The ¼-in. aperture is then sealed with adhesive tape, and the operators go on to the next point of application.

At Russell-Miller, the spot fumigation starts on the fourth floor and proceeds upward so operators keep ahead of any atmosphere concentrations of fumigant that might develop as a result of possible leakage from mill equipment.

Each bucket elevator is likewise fumigated through ¼-in.

(Turn to page 198)



PUSHBUTTON-OPERATED fumigator repeatedly delivers small doses—generally 2 fl. oz.—for each point of application.

It is designed so plant's air supply (A), in a pressure range of 40-100 psi., forces fumigant to required points. Filter removes dirt and moisture from air line, and there are relief valves to prevent any air-pressure damage. Reducing valve (B) is adjusted to pressure of 30 psi., which is indicated on pressure gage (C).

Fumigant can now be raised from cylinder (D) for discharge via nozzle (E), with working height of approximately 20 ft. (if it must be raised higher, air pressure is increased 1 lb. for each additional foot). Another reducing value (F) regulates control-air circuit. Its adjusting knob is turned until pressure of 15 psi. is indicated on pressure gage (G).

Adjustable orifice (H), on front of instrument panel, regulates amount of fumigant for each dose. Set behind panel, another adjustable orifice (I) regulates time cycle of each sequence (unit is factory-set to deliver rapid ejections).

When adjusted, operator pushes button (J), then quickly releases it (if held down, fumigant continues to flow, with dosage being inaccurate). Sequence can be adjusted so no fumigant is delivered until button is released. When adjusted, a time delay (5 sec.) is introduced into the sequence.

Located on front of panel, this button automatically controls emission of required fumigant dose. Check valve (K), installed in padding air-pressure line, prevents fumigant back-feed into air system. At end of tubing, another check valve (L) stops leaking.

CONVERTED BUS is rolling highways on 3-yr. itinerary of Armour branches to test over 6,000 drivers.

TELEBINOCULAR tests such points as a driver's color and depth perception as he views special slides.

Mobile Driving-Safety Lab Cuts Armour's Fleet Mishaps

When its accident costs soared over $1 million yearly, the company sent out a special "4-wheeled task force" on a 3-yr. campaign to check up on its drivers. Result: Big improvements all along the line.

A 5 TO 6% CUT in motor vehicle accidents is the boast of Armour and Company after its first year's operation with a mobile driver-testing unit.

It will take three years for the unit to complete its 100,000 mile coast-to-coast tour of Armour branches, covering drivers of 6,000 vehicles. To date, over 2,000 employees have been tested.

Prior to this program, motor accidents were costing the company some $1,250,000 annually. But the new testing has already saved $62,000, with immediate declines in mishaps scored by branches visited by the unit. Here, one of the most spectacular performances was Philadelphia's 45% slash of its previous year's total.

Automotive safety has long been a primary consideration with Armour. In 1953 the National Safety Council presented the Marcus A. Dow Award to Edward J. Emond, the company's director of automotive safety. Since Mr. Emond took charge of the department, the fleet accident rate has dropped from 7.50 to 3.21 accidents per 100,000.

The testing unit is installed in an air-conditioned bus. Manned by two qualified testers, the bus's equipment includes vision and reaction instruments and a motion picture projector.

When it reaches a branch, one of the testers meets with the manager to discuss the program and insure full cooperation of management. The branch's safety record is reviewed to spot specific problems. Then a testing schedule is set up, planned to assure as little as possible interference with normal operations.

Three-Part Checkups

Groups of drivers are first gathered for the lecture on the importance of the program and its direct benefits to them. Subsequently, the actual tests begin.

These are in three parts: (1) A written test to determine general knowledge of traffic laws and driving, (2) a reaction-time check of eye and foot-coordination, and (3) an instrument gage of variations in visual performance.

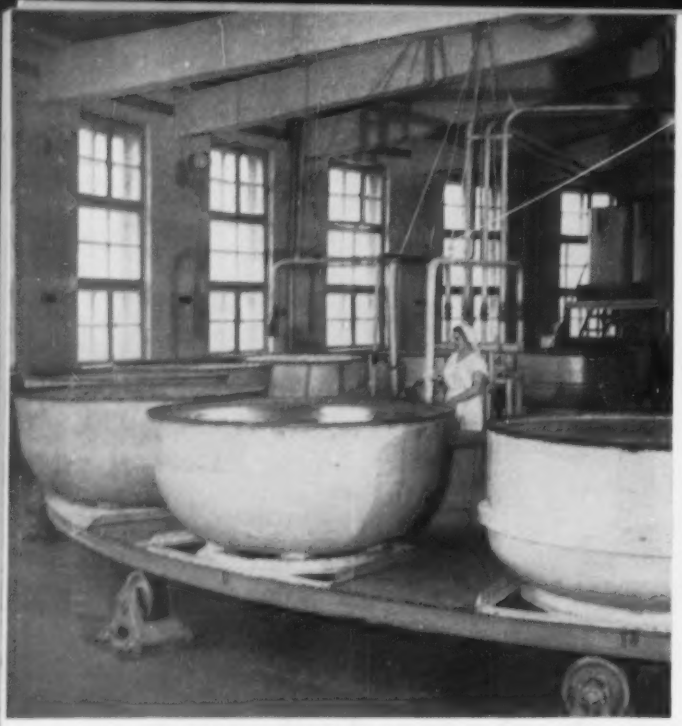
The written examination is given to five drivers at a time, seated at a desk in the bus. Questions are of the objective type.

Next, the reaction-time test has the driver sit before a panel with green, amber, and red lights. He "hits" the foot pedals when the appropriate light flashes. When his "stopping time" is determined, he is given a cardboard slide rule, which allows him to translate the time into feet of stopping distances at various speeds.

Finally, the eye test uses the Keystone Telebinocular. Through this instrument the driver views 14 color and black-and-white slides specially developed for modern vision examination. His reactions give the basis for scoring. He is checked for color and depth perception, near and far vision, and overall vision.

Grades on the tests then serve as the basis for any possible corrective action that may be indicated.

As a public service gesture, Armour has offered the facilities of the testing unit to police and other civic organizations in the cities along its route.

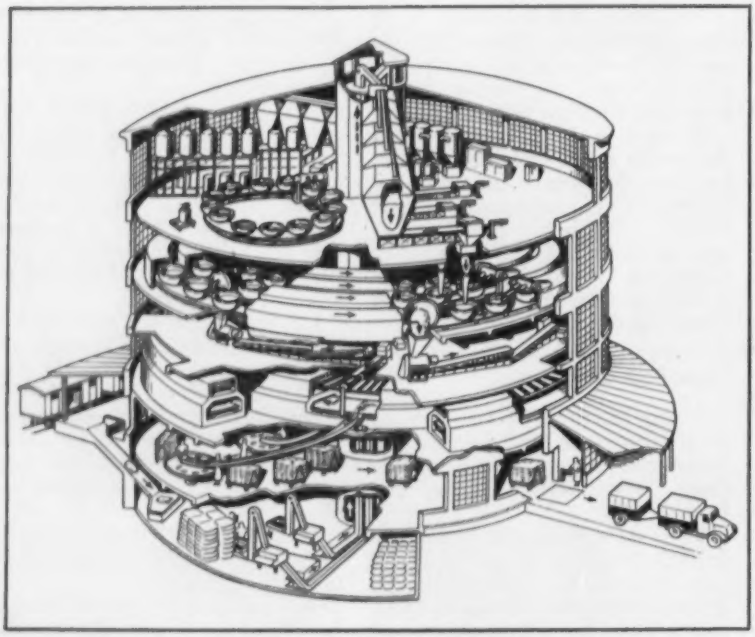


1 BAKING PROCESS begins on top floor, where liquid yeast is prepared in vats carried on slowly moving circular conveyor. Ingredients are stored here, too.

2 AT CENTRALIZED BATCHING station, also on top floor, dough ingredients are proportioned and fed to fermenting vessels in mixing hall below.

Russia Robotizes Food Plants

● Round bakery produces 250 tons of bread per day . . . Paper milk bottles automatically formed, filled, sealed . . . candy operations automated



ROUND BAKERY uses circular conveyors, gravity flow, stresses automation. Materials are received in basement, go to top floor by elevators (center).

SEABROOK HULL
McGraw-Hill World News

To demonstrate the degree of automation attained by Russia in the processing of foods, a number of examples have been cited recently.

Among these are the Marsakov system of bread making, said to be used in approximately 2,000 bakeries, the Krasnaya Vagranka milk bottling system, and advanced candy manufacture at the Red October plant, Moscow.

Equivalent automation is claimed in production of fruit juices and sugar.

Outstanding feature of the Marsakov bakery is employment of circular conveyors in a round building. These are said to result in a more compact plant that is cheaper to construct, maintain, and operate than conventional ones.

A typical installation, with capacity of 250 tons of bread per day (three 8-hr. shifts) employs 40 persons per shift. The plant (see drawing left) has a central vertical shaft that houses the circular conveyor drive-mechanisms, as well as bucket elevators that

3 CIRCULAR TUNNELS in mixing hall provide desired fermenting temperature for dough as it moves in vats (600 lb.) on variable-speed conveyors. Average time to complete travel is 6 hr. Note stations (rear) with chutes that bring dough-making ingredients from floor above. Before vats enter tunnels, dough is thoroughly kneaded.

move flour from bins in the basement to batching silos on the top floor.

On this floor, all ingredients are stored, prepared and weighed. And the entire process is monitored by a control station located here.

Dough-kneading hall occupies the floor below, with four circular conveyors moving vats of dough through temperature-controlled fermenting tunnels. Speed of conveyors can be varied to provide desired processing times for different types of baked goods.

Before entering a tunnel, vats are loaded with an initial charge of ingredients which is thoroughly mixed. Then, after traversing two-thirds of the circuit, they emerge to receive additional ingredients. After these ingredients are mixed with the dough, the vats re-enter the tunnel for the final fermentation.

At the end of approximately 6 hr. the vats discharge from the tunnels. Then the dough is again kneaded and dumped into chutes that feed it to dividing machines on the floor below.

Dough pieces are conveyed in canvas buckets through proofing chambers, then are automatically fed to

Turn Page for More Russian Processing →

4 VATS OF DOUGH emerge from tunnels after traversing two-thirds of circuit. They receive additional ingredients, then dough is kneaded and vats re-enter tunnels.

5 AT END of tunnel, dough is mixed 2 min., then discharged to chute that feeds divider on floor below. Next comes proofing, and baking in traveling ovens.

6 BAKED LOAVES are discharged from circular traveling ovens and slide down chute to revolving table on floor below. Here, the long loaves are checked for quality then placed on racks (not shown) and allowed to cool before they are loaded on delivery trucks.

7 IN THE DAIRY FIELD, the Krasnaya Vagranka machine forms milk bottles from thin cardboard sheets, coats them with paraffin, then cools, fills, and seals them at speed of 3,000 per hr. These operations are performed in a continuous sequence.

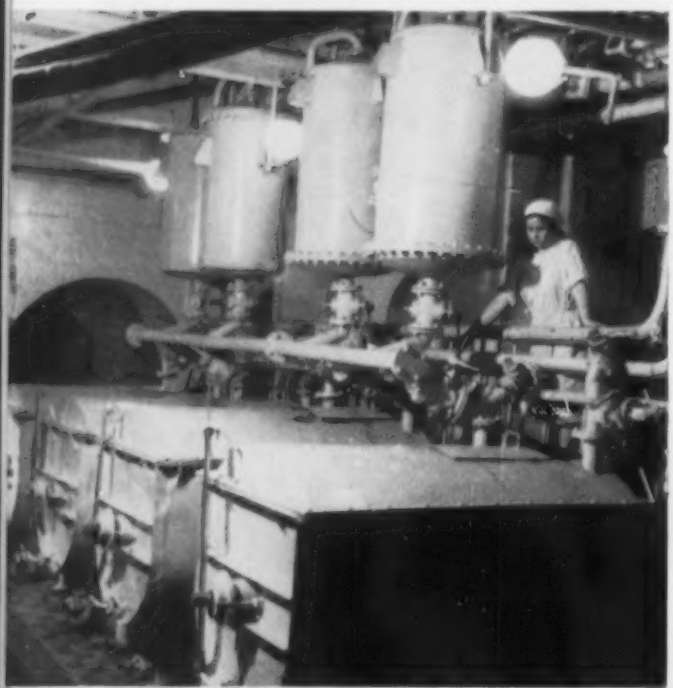
traveling ovens mounted on circular conveyors. Each of the fermenting tunnels has its own proofing chamber and traveling oven to provide four separate production lines.

Some of the operations in these bakeries are initiated by hand. At the USSR Research Institute, however, a completely automatic bread production line is said to have been developed. Among advances claimed are continuous mixing and fermenting of dough without use of kneading vessels.

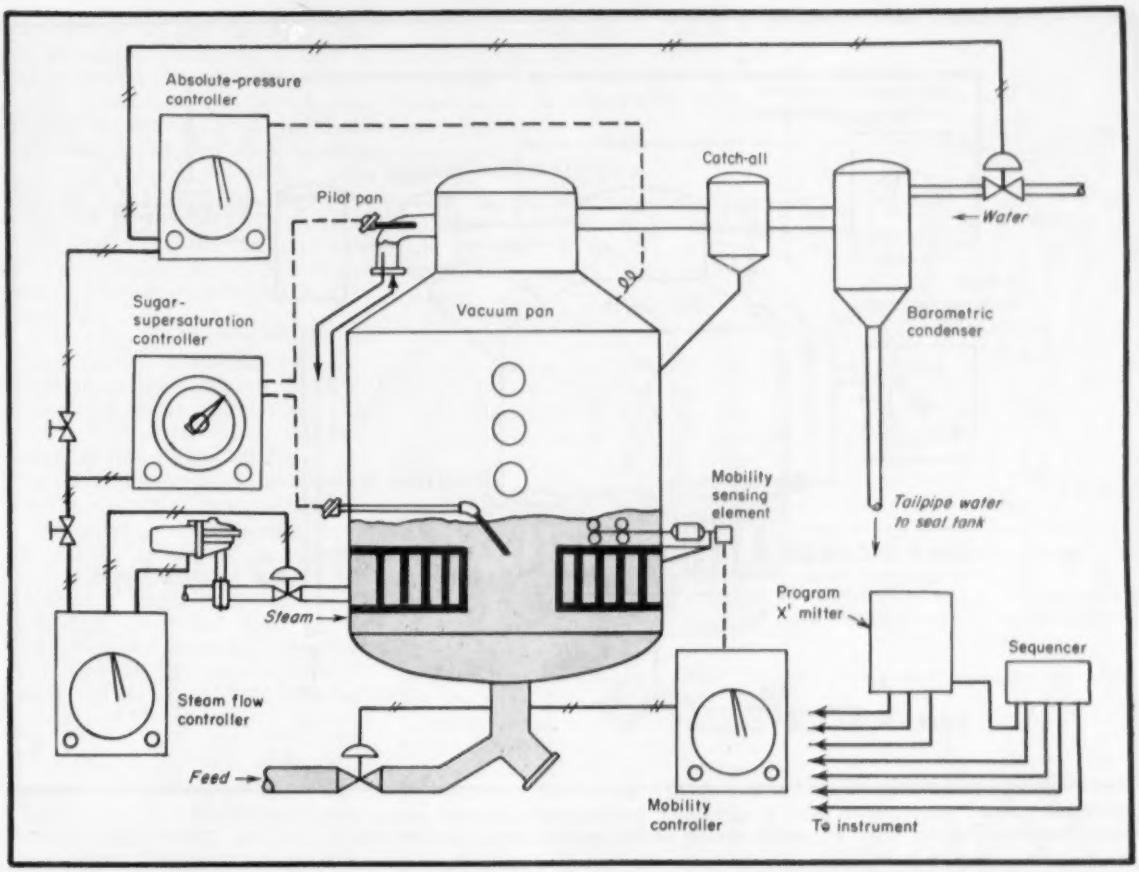
Dairy and Candy Advances

Notable dairy development is a milk bottling machine that forms cartons from a thin cardboard sheet then coats them with paraffin, and cools, fills, and seals them all in one operation.

In the confectionery field, the Moscow factory produces assorted candies at a rate of 2 million pieces per hour. All operations from preparation of ingredients to packaging are said to be done automatically with only manual supervision at certain stations.



8 & 9 IN THE CANDY PLANT, caramel paste is automatically mixed in vats (left), then discharged to forming machine (right) that deposits it in pans.



AUTOMATIC CONTROL system for sugar vacuum pan. Supersaturation recorder-controller is basic component of four interacting control loops. Absolute pressure, steam flow, and crystal growth (after grain establishment) are controlled, together with sequence of operations.

Application of Supersaturation Meter Permits

Automatic Vacuum Pan Control

Control of sugar crystal formation no longer requires guesswork. Classic example of instrumenting the "art" in critical food processes

DONALD R. HALL

Application Engineer, Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Philadelphia

When first made available to the sugar producers, the supersaturation recorder was used as a seeding guide for the pan boiler. With it, the boiler could consistently seed his pan at the exact supersaturation value.

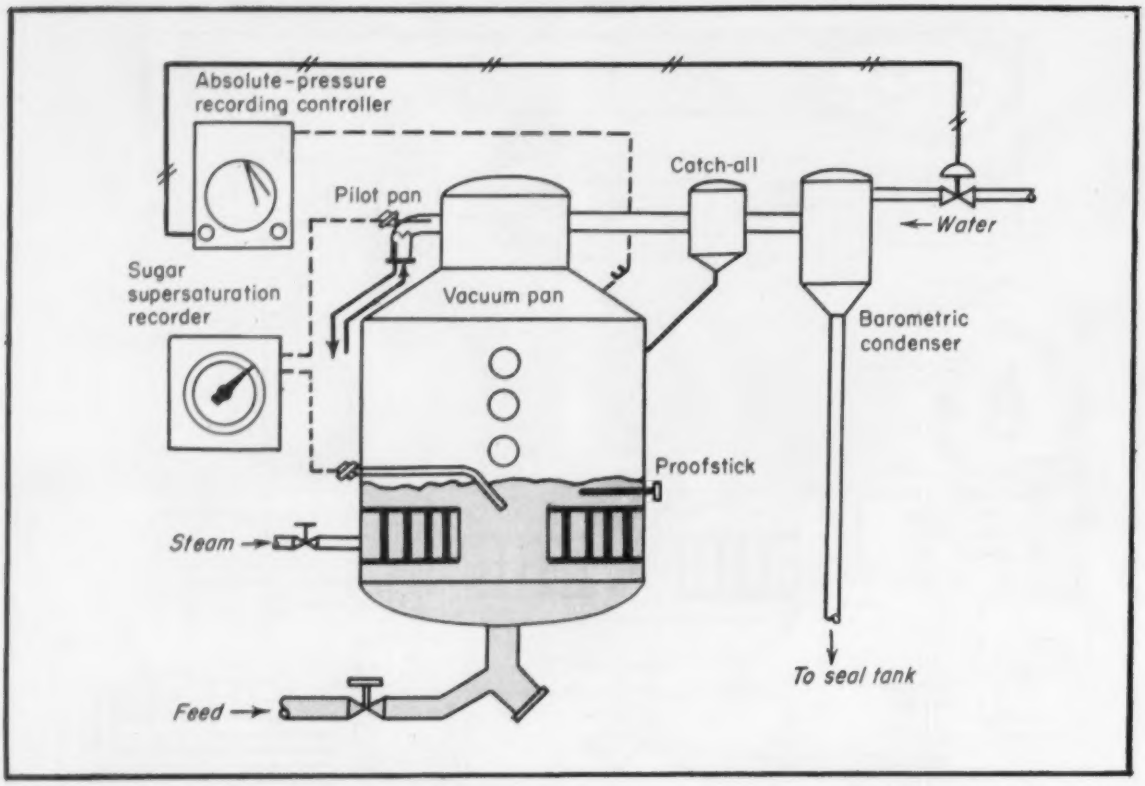
Then pan researchers began to use it to obtain continuous experimental data on supersaturation during initial boil-up, seeding, and grain-establishment periods. This focused attention on the development of a control system based upon the measurement of supersaturation.

Over the past year, work along that line was conducted in cooperation with some of the leading beet and cane sugar companies. The result is a successful system for automatic vacuum pan operation.

This automatic system consists of four interacting control loops, with the supersaturation recorder-controller as the basic component. Briefly, these instruments accomplish the following functions:

(1) A throttling butterfly valve regulates the water to the barometric condenser and controls the absolute pressure.

(2) A differential-pressure instrument measures the steam flow and pneumatically proportions the heat added to the calandria of the vacuum pan.



SUPERSATURATION recorder, used in connection with absolute-pressure controller, is employed as a precise seeding guide for the pan boiler when automatic control of the vacuum pan is not desired.

(3) Crystal growth is controlled after grain establishment by measuring "tightness" or "mobility"[1] of the crystalline mass with an agitator paddle. Then the feed addition is regulated as a function of the paddle's power-consumption or torque.

The sequence employed in automatically operating a pan is generally as follows:

During the initial boil-up period, the rate of supersaturation rise is controlled. This is done by measuring the supersaturation and cascading a programmed control signal to the set-point of the absolute-pressure controller or steam-flow controller. The choice of variable selected is contingent upon the response characteristics of the unit in question, as well as upon the user's preferred operating technique. With this type of control, boil-up rate is regulated as a function of supersaturation. In addition, the process lag normally encountered in high-capacity processes such as this is diminished.

When the seed point is reached, the supersaturation controller automatically introduces a measured amount of seed solution into the pan. Absolute pressure or steam flow is then varied to aid in the establishment of the grain. Upon completion of this step, the absolute pressure and steam flow are held at constant optimum levels, and the rate of crystal growth is regulated by the "mobility" controller.

A master sequence control cuts these units in and out of the control circuit at the appropriate time. And it allows the pan to be charged, started-up, stopped, and dropped automatically.

Supersaturation Recorder

Now let us look further into the heart of this system—the supersaturation recorder.

Early studies in sugar refining, notably by A. L. Holven of California & Hawaiian Sugar Refining Corp., showed that sugar supersaturation could be generally described by an equation[2]. Relating the boiling point of the sugar solution to the boiling point of water at the same absolute pressure, this equation (below) has a family of curves for each value of sugar solution purity.

$$\text{Tan } \theta = \frac{T_w - K}{T_s - K}$$

where:

T_s = Temp. of massecuite or fillmass

T_w = Temp. of saturated steam at the same absolute pressure as T_s

K = Linearity correction factor

Unfortunately, this equation was not definite enough to use in designing a meter circuit. It did not show the influence of boiling point rise on the temperature of the sugar solution.

To develop a more accurate electrical circuit approximating the characteristics of this equation, it was necessary to mathematically relate boiling-point rise (ΔT_s) with T_s. This work was undertaken by T. R. Harrison and A. C. Casciato[3], and the following expression resulted:

$$T_s = (T_s + 75)\left[\frac{X(S_s) + 32 - (K_s)}{7220Q}\right] - 0.0086$$

where:

T_s = Boiling-point rise, deg. C

T_s = Sugar-solution temp., deg. C.

X = Relative saturation

(S_s) = Concentration of the solution at saturation and temp. T_s

(K_s) = Linearity correction factor at concentration of solution

Q = Purity factor

The final circuit[4] for the supersaturation meter is based on these two equations.

It is important to understand the principal difference between this device and a boiling-point-rise recorder. The supersaturation recorder not only measures T_w and T_s, it also computes the tangent of the angle θ and compensates for the purity of the solution. Thus, the instrument directly indi-

cates and records supersaturation. And as mentioned previously, it can be adapted to control.

This instrument is a Brown ElectroniK recorder having two resistance-bulb temperature-measuring elements. One bulb is immersed just under the surface of the sugar solution in the downtake of the vacuum pan's calandria. The other is inserted into a pilot pan mounted on the top shoulder of the vacuum pan, near the entrainment separator.

Function of the pilot pan is to provide a location for measuring the temperature of the saturated steam or water vapor at the same absolute pressure as that of the massecuite. It is necessary to use this method because the vapors driven off from the boiling sucrose solution contain superheat.

The pilot pan is fed with a stream of very hot water, or it is heated by a submerged steam sparge. The overflow is drawn off through a line connected to a seal tank, or the tailpipe of the barometric condenser. The bulb in this unit is mounted above this boiling water, and the temperature of the condensing vapors is measured.

Location, as well as the design, of the pilot pan is important. There should not be any pressure differences between the vacuum pan and pilot pan. Thus if a pilot pan were installed downstream on the vapor line, erroneous readings would result because of the pressure drop across the entrainment separator and catch-all.

This brings up the importance of absolute pressure control. If the supersaturation recorder is to function satisfactorily it is necessary to regulate the vacuum throughout the entire run. Otherwise the pilot-pan bulb, which is more sensitive to absolute-pressure variations than the massecuite bulb, would make the recorder sense what the supersaturation should be when an upset in absolute pressure occurs.

On the other hand, the temperature of the boiling solution, which is a function of absolute pressure, would respond much more slowly and thus require longer to reach equilibrium.

This factor, however, is not a limitation of the supersaturation recorder. Absolute pressure normally should be controlled in any case.

An example of the need for such control can best be illustated by considering the characteristics of the process at the critical point just prior to and following the seeding. Assuming that a sudden pressure change occurred at this stage, which is sometimes the case, then seed would be melted out, or "false grain" would appear, and time-consuming corrective steps would have to be taken.

The absolute-pressure controller allows the supersaturation recorder to function properly, and at the same time provide the process with the necessary stability.

Crystallization Problems

The process of crystallization involves pitfalls. It is desirable to form pure and uniform crystals, and it is necessary to regulate the growth of these crystal nuclei without forming new, unwanted "false grain". It also is desirable that these crystals form as single, sharp-edge, uniform units, and not in clusters or agglomerates which include impurities in their structure.

Examination of the supersaturation zone shows it to be subdivided into three areas. In order of increasing concentration they are: the metastable zone, the intermediate zone, and the commercially undesirable labile zone.

In the first zone, when fine crystals are added to the solution as a seed, they will grow without the formation of new nuclei. The second, or intermediate, zone will also allow seed crystals to grow, but not without the formation of unwanted additional crystals. Labile—the name of the third zone—is somewhat deceptive in terms of the desired end results. Although the crystals form easily in this zone, they also form spontaneously and uncontrollably.

The crystallizing technique called "full seeding" is currently receiving wide acceptance. It consists of adding the total nuclei of the desired crystal population while the solution is in the metastable zone. In this manner, crystals can be grown to the desired size and number without the formation of any unwanted new crystals or "false grain".

Adoption of this last method accentuated the need for measuring and controlling the temperature and absolute pressure, and the feed addition rate became increasingly more important.

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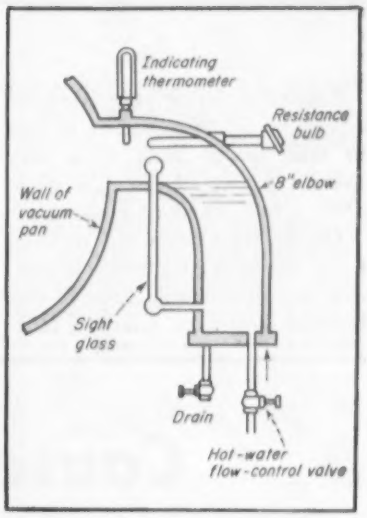
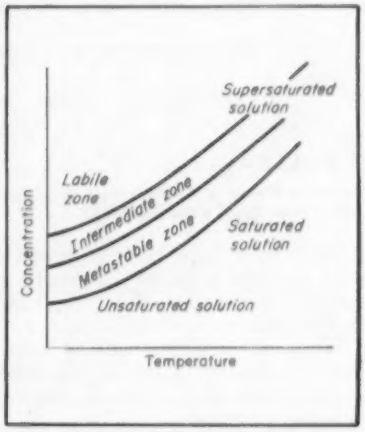
5. J. D. Price, "Sugar Supersaturation Recorder: Latest Development in Seeding Technique." *Sugar*, 48-49, Mar. 1954.

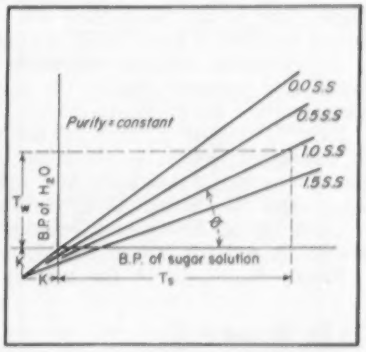
The above article is from a paper presented at this year's annual meeting of the Institute of Food Technologists at Columbus, Ohio.



PILOT PAN for supersaturation recorder, shown in cross section. This permits measurement of saturated steam temperature at same absolute pressure as that of massecuite.



THREE ZONES of sugar supersaturation. Widely accepted technique is "full seeding" in metastable zone to avoid "false grain" and "smear."



HOW sugar supersaturation is related to the boiling points of sugar solution and of water. This relationship is expressed by an equation (see text) for supersaturation meter design.

Packager's Place in Economic Cycle

Before exploring the detailed aspects of fill variations, it is well to take special note of a very relevant matter—that is, the packager's actual economic position.

His factory receives raw material from the farm or another factory, and then adds to the value of this material by mixing, grinding, cooking, drying, or otherwise processing it into the item to be sold.

To get this product to the customer, the packager must divide it into unit sizes that suit the use of the customer, and then place each unit in a container that will afford protection until the customer is ready to use it.

Thus, the food factory is merely a step in supplying the nation—comprising processing and packaging that must be accomplished with the utmost economy.

The costs of raw materials are fixed in the open market, therefore, the individual packager cannot influence them to any extent.

Causes and Corrections Of Package-Fill Variations

Underfill loses you customers, can also bring Government action. Overfill is certain to eat your profits. And you can't wholly eliminate such differences . . . But you can tightly limit them—as demonstrated here

E. P. LEE

Assistant to Director of Manufacturing & Engineering
General Foods Corp., White Plains, N. Y.

Since it is impossible to produce packages without some variation in fill, no commercial packer can guarantee that all his packages will be "right on" the weight stated by the label.

We must, rather, be satisfied with a degree of control that is technically practical, economically reasonable (see special panel above), and in keeping with good manufacturing practices.

The latter can be related to a balance between causes and solutions and the control of causes and the control of solutions. These forces pivot on satisfaction to the consumer and profit to the manufacturer.

Before solutions can be developed or controls applied, causes must be identified. Here is a routine for locating factors resulting in variations in package fill:

To determine product uniformity check (a) specific gravity and apparent density, (b) homogeneity, (c) flow characteristics, and (d) compacting.

Next, investigate accuracy of the filler. If this unit is volumetric, check (a) container measure, (b) cavity measure, and (c) time-flow. And if it is a weight-type filler, check on whether scaling is (a) net or (b) gross.

Operating conditions bear investigation of (a) physical conditions and (b) human considerations.

Finally don't overlook the controls.

On Sp. G. and A. D.

Now let's go over the checklist and consider product uniformity with reference to specific gravity and apparent density. It is readily seen that, if you are measuring by volume and if at one time it takes 800 cc. to make a pound while at another time it takes 1,000 cc., the fill will vary unless a correction is made (see Charts 1 and 2).

If the product is a liquid, the effect of temperature and/or air entrainment may alter the specific gravity. A few degrees change in temperature may require an adjustment of 1/8 in. in the fill-height on a bottle. Air entrainment could make a 1/2 in. difference in the same container.

In the case of one product, an allowance had been made for air and the bottles were regularly inspected for fill-height.

But then, as sometimes happens, the conditions changed: A new pump that didn't mix in as much air as the old one caused a give-away in overfill of product that ran to a $40,000-a-year loss before it was discovered.

To go on to the effect of apparent density in net weighing, consider that your accuracy is partially a function of the scale's ability in accurately stopping the flow of product into the weigh bucket. Add to this the fact that the flow is usually a fixed volume.

The rate of flow by weight will vary with a change in apparent density. The scale has no automatic means of detecting such a change, and it has a relatively constant lag when it comes to stopping the flow.

Thus, accuracy of scales is related to changes in apparent density.

Homogeneity and Flow

The homogeneity of a product is related in a way to the apparent density. It is a problem primarily associated with dry powders. Products that are mixtures are frequently blended before packaging. This may take 5 to 30 min., depending upon the product.

Surprisingly enough, operation here of the mixer for more than the standard time may reverse the blending action and actually unmix the product.

Further, if one constituent of the product has a den-

Gives a Pointed Frame of Reference

The costs of packaging materials are likewise beyond the influence of the packager. Speedy, efficient operation is the only solution for keeping costs down and staying in business.

Packing rates of 30 to 50 units per minute are considered slow; 50 to 80 per minute normal. Meanwhile, today's high speeds run 80 to 150, and there have been developed single units to operate in the 300 to 600 units per minute range.

Volumes of 1,000,000 packages a year are considered small. In fact, volumes of 1,000,000 packages per week are common, and those of 1,000,000 per day are not unusual.

These speeds and these volumes inevitably involve some variation of package fill. The packer cannot ignore these variations, since his entire effort may be jeopardized if the amount put in is inadequate (or even appears to be inadequate) because of slack fill.—E. P. L.

sity appreciably greater than another, separation may seriously affect package fill. Such products, including those that have a common source but are not of uniform particle size, may also unmix in handling before they get to the filler.

You have seen this effect in a gravel pile, where the heavy stones have rolled to the bottom and to the side, while the smaller particles are concentrated toward the center and top.

As for the third aspect of product uniformity—the flow characteristics—dry products and powders involve several inherent factors that are important.

One of these is the angle of repose—that is, how the side of a pile inclines with respect to the horizontal. This angle changes with moisture content, particle size, and other properties of the material.

How does it affect the operation of a filler? Here are examples:

If we have a tall bin and fill it with a product having a high angle of repose, it will fill up in a sharp peak. The height of the pile, or the head over the discharge point, will drop as the bin is emptied, thus altering the effective height of the pile.

The difference between these two levels will cause the rate of flow to change and thus change the package fill. Also, incidentally, this provides another opportunity for the product to separate.

As the angle of repose is exceeded in this bin, the higher sides of the pile will collapse and the effective height (central head) will increase. This occurs alternately as the bin is emptied, and is the cause of considerable trouble with many products.

The angle of repose will also affect the flow of product from auger type fillers. If the pitch of the auger is not flatter than the angle of repose, the product will not stop flowing when the auger stops, and the dribble will cause package fill to vary.

Re Compacting

Products that compact, like snow into a snowball, must be handled with extreme care. Cake mixes offer examples. Here, variations in pressure will change the

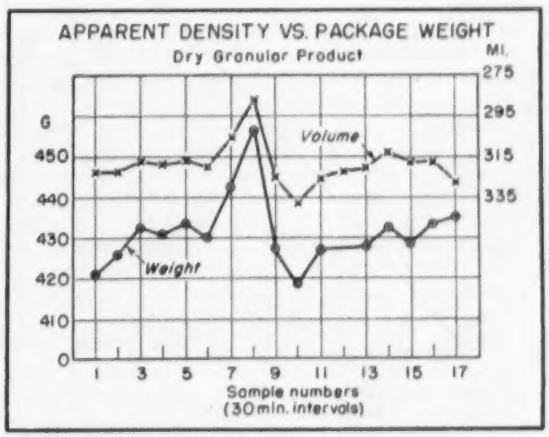


CHART 1—Graph lines show what happens to package weights when correction isn't made at the time apparent density changes. Weight varies to a slightly greater extent than the apparent density.

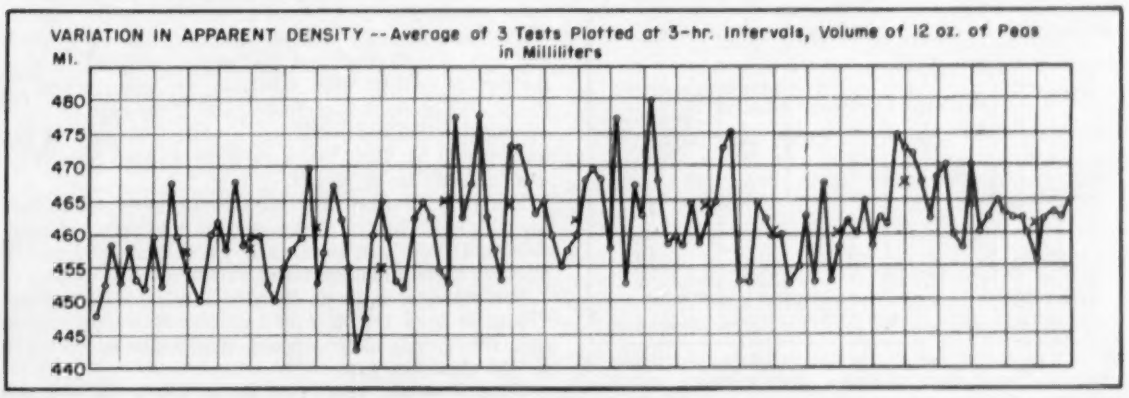


CHART 2—Plot of volume of 12 oz. of green peas taken every 3 hr. for several days. Note change, test to test, and trend as season continues. Volume rises, and at end of period becomes less variable. A good-size processing plant will pack 500,000 packages (over 185 tons) a day, and it takes exceptional skill and good fortune to keep package weights within reasonable limits at all times in this kind of an operation.

Charts Continue on Next Page→

degree of compacting. This, in turn, will change the flow characteristics and the apparent density. Both will cause package-fill variations.

There are also those extreme conditions, such as with French cut beans, French fried potatoes, or shredded coconut, where pieces interlace like jackstraws and so flow only with the greatest difficulty or not at all.

Filler Aspects

Next on our list are the two basic fillers, the volume and the weight types.

The volume units are the more common, being relatively simple, inexpensive, and adaptable to high-speed operation. These, as indicated, divide into those using the container as the measuring element, those that have a self-contained cavity for measuring, and those that use a time-flow relationship.

The container-measure type is accurate only to the extent that the container is accurate at the time of filling. There may be other problems, but certainly the factor of the container is of prime importance.

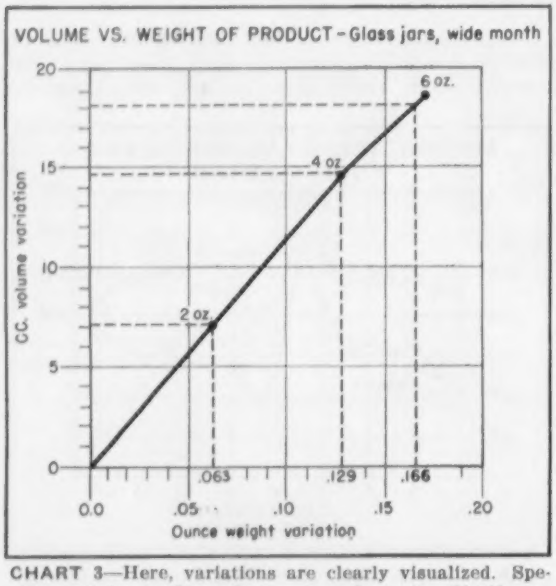


CHART 3—Here, variations are clearly visualized. Specific container volume figures are: 2 oz. jar, 234.28 c.c., ±3.695; 4-oz. jar, 460.70 c.c., ±7.395; and 6-oz. jar, 672.79 c.c., ±9.225.

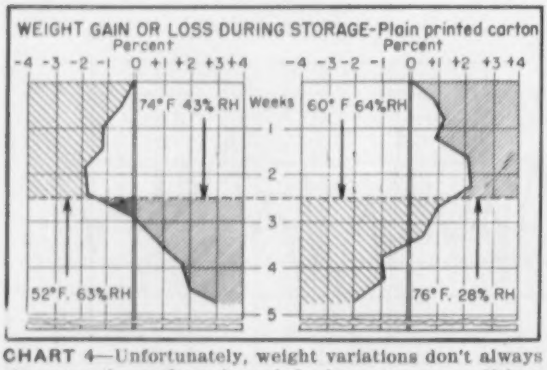


CHART 4—Unfortunately, weight variations don't always stop once the package is sealed, since storage conditions may cause changes. Shown here are test results with two equal groups of carefully weighed cases of a grain product. These lots were stored under different conditions, then after a few days their positions were reversed and weights again watched.

For example, a great number of grocery store products are packed in glass containers. And glass is not only an excellent carrying medium for many of them but, for some, the only practical medium.

However, for a number of reasons, it is not possible to make all glass containers alike.

In one case, we investigated the effect of container volume on weights, with jars of maximum and minimum capacity run alternately through the filling machine.

After we had analyzed the results (see Chart 3), we found that the jars we had planned to use for 2 oz. of product varied 7.39 cc. and the weight of product varied 3.2%. Further, the 4-oz. jars varied 14.8 cc. and the weight of product put in them differed 3.1%. And the large 6-oz. jars ran to a 18.5-cc. variation and the fill weight 2.8%. This represents the best that can possibly be done with standard commercial glassware.

As for the fillers incorporating self-contained measuring cavities, these are in very wide use. The cavities must be of correct shape and contour. Those that are too flat won't fill properly. Neither will those that are too tall. Also, there must be proper relationships between diameters and depths of the cavities.

Where a machine has more than one cavity, it is, of course, necessary that all be exactly the same.

Our third volume-filler class—the time-flow units—depend on creating a uniform flow of material and then controlling the amount of fill by regulating the time during which this flow occurs. And pressure or gravity devices are remarkably good so long as the pressure is constant and resistance to flow is uniform.

Pumps for liquids or augers for dry products are also satisfactory so long as there is no slip in the pumping and the means of starting and stopping are accurate.

Consider, however, that a clutch that slips one-quarter of a revolution in stopping an auger may cause a variation in package weight of 2 or 3%

In all of the time-flow devices, filling error increases as speed is increased beyond reasonable limits.

Weight Units

Of the two basic types of weighing fillers (net and gross), the first scales the product and then puts it into the container, while the second weighs container and product together.

Both types typically use a balance beam, though there are some new ones that do not.

Though we speak of these devices as scales, they have many of the characteristics of time-flow volume fillers, often operating at speeds from 12 to 20 cycles per minute. Their basic accuracy depends on the skill with which the scale was devised and the means provided to stop the flow of material when a balance has been reached. Pivots and bearings have to be good if they are to stand up under 3,000,000 weighings a year. The mass of the beam must be kept low if it is to respond rapidly to small increments of weight.

Electrical controls that require no more force than the magnetic damper on an analytical balance are available, and they have been used. Even these refinements, however, have limitations and variations.

For example, suppose we have a solenoid that closes a gate to stop the flow of product. If it operates on ordinary 60-cycle electric power, it will take up to 1/120 sec. to close the gate.

Then if we are weighing 1 lb. in 3 sec., the flow will be over 5 oz. per sec., or more than .05 oz. in 1/100 sec.

Should this error seem small, consider that it is the best than can be done if everything else is perfect, and thus represents a minimum error.

Averaging this much under or overweight on all packages, this minimum error will amount to 30,000 lb. in 10,000,000 packages.

Gross weighing is resorted to either when the product is sticky and cannot be depended upon to drop clean from the net weigh bucket, or when it is so dusty that the drop from a net weigh bucket would make such a mess as to gum up the scale and surrounding area.

A lack of uniformity in the tare weight of containers is a major cause of fill variation with this type of filler. Glass containers are poor in this respect, and metal containers aren't much better.

Paper containers also have their variations. We have found as much as ½ oz. difference in the plain cartons used for 12-oz. of cereal. Thus, tare weight is a source of fill variation.

Probably less is known about the effect of operating conditions on package fill than any other cause. We personally think this is true because everyone expects things to go along as designed and planned—which is not necessarily the case.

Maintenance of equipment is extremely important, and the need is not always evident. In one plant we have been able to establish that the wearing of the hard chrome plating on the inside of volume-measuring cups affects accuracy. In another case we found the volume filler with a bent shaft, causing the size of the measuring cups to vary.

Influence of Humans

We could review many of the other physical effects on package fill, such as matters of constant head, uniform speed, spillage, and packing room humidity, all to be included under operating conditions.

More important than even these influences are *people*. Nothing gets done without people, and all too often we forget that people are human.

The skills of people differ. We have found that it rarely takes less than six months and may take two years to train a man in the operation of a multi-scale filler. And even the skilled operator is not infallible, for job routine has been known to blind them to the unusual.

One inspector was actually hypnotized by the bright light reflected from the tops of metal cans she was supposed to be inspecting.

Further, the State of West Virginia recently held up several hundred jars of one of our products because they were only partially full. Investigation showed that a new crew, on the job for only two days, had packed this product between 3:00 and 4:00 A.M.

Apparently, the volume filler, running at over 200 jars a minute, ran almost empty. The automatic switches failed, and the jars went past four operators and an inspector without detection.

At any rate we owe West Virginia our thanks. We could have had a lot of unhappy customers.

What way can there be of setting up complete and absolute barriers to prevent such things as this?

Import of Controls

To guard against shifts in package fill, an alert management sets up a system of reports and controls. These are not automatic instruments, although they have some of the same characteristics. By the term "controls" we refer both to standard ways of doing the job so as to minimize fill variation, and regular inspections and reports of inspections that serve to focus attention when something goes wrong.

The manufacturer who makes no inspection of package fill has no control and must accept a very great chance that package fill will be in error without his knowledge. On the other extreme, the manufacturer who inspects 100% of his packages still does not have complete assurance that all packages are satisfactory—for people are human, and even machines are not infallible.

As a result, most manufacturers compromise. They inspect a large percentage of the output visually or by machine, to detect, if possible, gross errors in fill. In addition, they check a small number of packages very carefully and then estimate the true situation.

Actually, what is done is to set up a patrol like that of the police department or a weights-and-measures department. This is a compromise between the cost of inspection and assurance that can never be complete assurance. The greatest service derived from such inspection is to help the manufacturer seek out and correct the causes of fill variation.

When such a cause is found, the "detectives" of production, engineering, and research departments are called in to trace it down and arrest the cause if possible. Without controls we would not be aware of the variation or its magnitude. Therefore, the degree to which effective controls are applied affects package fill.

True, we may be stretching the point too far to list controls as a cause of fill variation. However, lack of controls certainly contributes to fill fluctuation.

Here is an additional influence that calls for consideration: The fact that variation in weight does not stop when the package is sealed. Storage conditions may affect weights.

To test this on a grain product, we carefully weighed a number of cases, divided them into two equal groups, and stored them under different conditions. At the end of a few days we reversed the positions of the two lots and again observed what happened to their weights. The results for the two groups are shown in Chart 4.

Offhand, it would seem easy to correct this condition by using a moisture barrier as a wrapping. Unfortunately, nature will not always cooperate, and sealing this product up tight spoils the flavor in a comparatively short time.

Limits, Options, Choices

Final comments: Within limits, there are solutions to most of the causes of fill variations. Some of these are practical, some are not. No solution or combinations thereof will eliminate all variations. And no solutions or systems of control will give complete and economic assurance that underweights will not occur.

Under the Federal Food, Drug & Cosmetic Act and most state laws and regulations, the manufacturer is given the option of labeling his product as containing either a minimum quantity or an average quantity.

If he elects to use average quantity, then tolerances are permitted, consistent with good packing and distribution practices.

The manufacturer, when faced with this choice and the many causes of fill variation, almost always finds it necessary to think and act in terms of the average as he fills and labels.

Because of this situation, an inspection by an enforcement agency will find variation in fill from package to package. However, the larger the number of packages inspected, the more reliable will be the estimated average.

The manufacturer asks only that the number of packages tested be large enough to be truly representative before any conclusions are drawn regarding the average or the tolerance.

The above article is a presentation of the author's paper delivered at this year's National Conference on Weights & Measures at Washington, D. C.

BOTTLING ROOM has four filling lines (with space for a fifth), plus high-speed labelers (one seen in foreground). These enable production of several sizes and types of bottles, and different flavors, simultaneously.

Conveyor-Filler-Packer Setup *For Capacity Plus Versatility*

Four fast, multi-size bottling lines ease production of 50 different items. Automatic uncasers, palletizers improve entire operation

FE STAFF

Efficient layout, which minimizes conveyor lengths, and the employment of the latest, high-speed bottle filling and handling units are outstanding features of the huge new Maspeth, N. Y., plant of Canada Dry Ginger Ale, Inc.

Described as one of the largest in the world, with production capacity of 29,000 cases of soft drinks per day, this 200,000 sq. ft. plant was so carefully engineered that only a mere 350 ft. of bottle conveyors and 500 ft. of case conveyors are required.

From unloading of empty bottles, through the entire sequence of production to loading of full goods onto trucks, individual bottles need never be touched by hand. Even manual handling of wooden cases has been minimized, through use of automatic palletizers and fork-lift trucks.

The plant produces a complete line of mixers, flavors, and dietetic beverages in quarts, pints, and splits (7-oz.). In addition to packing in regular wooden cases, some go in 6-bottle carry home cartons, and others are made up for export, making a total of more than 50 different items.

High-Speed Lines

Each of the plant's four production lines (space has been provided for a fifth when needed) is comprised of a soaker-washer, equipped with automatic case unpackers (Meyer Dumore), fillers, and automatic case packers (Standard-Knapp). And three of the lines have labelers that can be by-passed when ACL (applied color label) bottles are being filled. One line is also equipped with an automatic carton-sealing machine for packing non-returnable bottles or export merchandise.

The washers, all 5-compartment Dumore units, include two universal machines that will handle all sizes of bottles (quarts, pints, splits) used in the plant. One of these is 16 wide, the other 26.

The other two washers accommodate pints and splits only. One is 24-wide, the other a huge 32-wide machine that can turn out 425 bpm. Combined capacity of the four washers is 1,100 bpm.

Automatic Bottle Handling

The uncasers are attached to and driven directly from the washers. They comprise:

1. Two or three unloading heads, depending on size of washer.
2. A short conveyor that positions cases of empty bottles under the unloading heads.

In operation, cases arrive on conventional conveyors, then move (one at a time) onto the short conveyor

section of the uncaser. First case moves to the proper position under the far head. Then second case moves up and is positioned under next head. And in the 3-head unit, a 3rd case is positioned under the last head.

When cases are all in position, heads descend and air-operated jaws close firmly around necks of individual bottles. Heads rise vertically and lift the bottles clear of the cases, then move forward over the washer infeed table and gently deposit them on it.

As soon as the bottles are lifted clear, empty cases are released and move to the case packers. Filled cases immediately go into position to be emptied.

Operation of the different elements of the uncasers are synchronized so that the units cannot function unless the washer is running, and so that two cases cannot enter the conveyor section at the same time. Safety stops are provided to prevent damage to machine or bottles.

Fillers include two 60-spout high-speed Meyer machines, one with a capacity of 425 splits per min., the other 256 qt. And another 60-spout Meyer unit will handle 256 pints or splits per minute. Fourth line has two 40-spout fillers (Liquid Carbonic) operated in parallel. These handle any of the three sizes of bottles at 200 per min.

Four-head tandem World labelers (Economic Machinery Co.) are installed in three of the lines. These simultaneously apply body and neck labels and a foil top wrapper.

Palletizers Complete Job

Labeled or ACL bottles are conveyed to automatic case packers (Standard-Knapp). Single-head or duplex units are employed according to speed of the line. When bottles are to be packed in cartons, special openers are moved into place to provide a continuous flow of opened cartons to the packers.

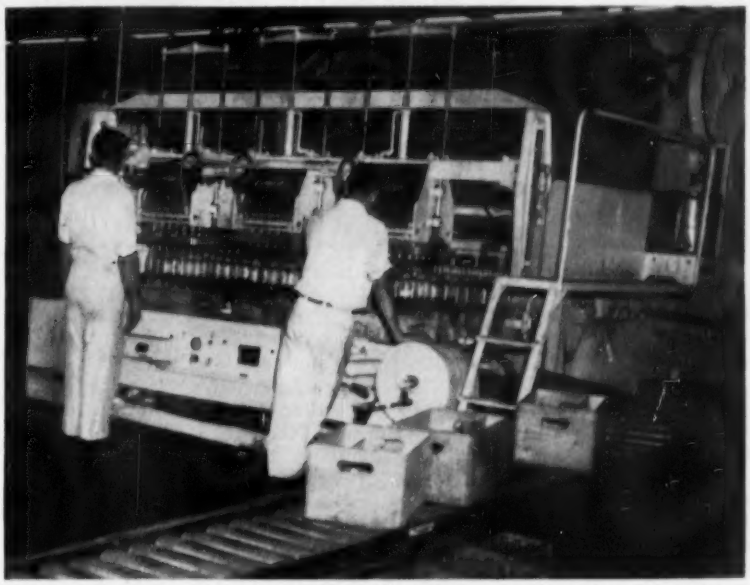
Handling Minimized

Filled cases move by conveyors from the packers to a battery of four automatic palletizers (Lamson) just outside the production area. Adjacent to these units are the unloading stations where cases of empties are transferred from pallets to conveyors that move them to the unpackers.

This arrangement provides a regular supply of empty pallets for the palletizers without unnecessary handling.

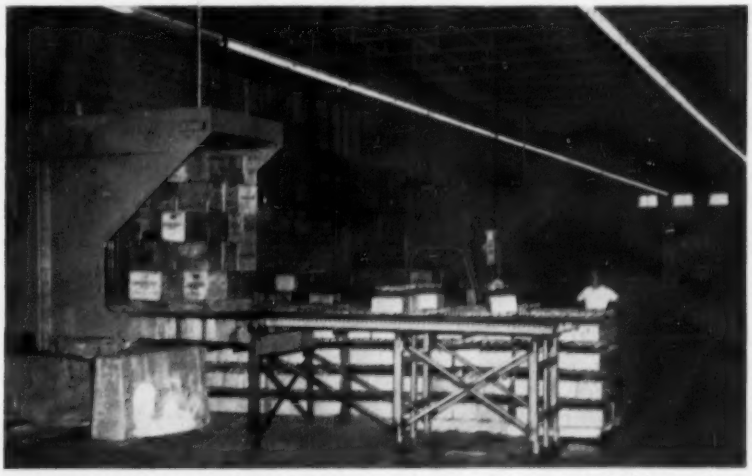
The automatic palletizers assemble and arrange cases in interlocking loads of 36 pints, 40 quarts, or 56 splits. When fully loaded, pallets are discharged to a conveyor platform, where fork lift trucks pick them up and move them to the warehouse or to truck-loading area.

Because of the more than 50 different items produced, a large warehousing area is required with an elaborate system of controls that insure first-in first-out movement of all goods. The loaded pallets are triple-tiered, giving the 200x355 ft. area a capacity of 500,000 cases.



UNLOADERS automatically remove bottles from cases and deposit them on washer feed table. Empty cases are then conveyed (foreground) to . . .

. . . **PACKERS** that assemble and case filled bottles. Cases are conveyed (background) to . . .



. . . **AUTOMATIC PALLETIZERS** that arrange them in an interlocking pattern on wooden pallets. Loaded pallets are discharged to conveyorized platform for removal by fork truck to warehousing area.

CUES FROM THE COURTS To Aid Your Legal Steering

★ Is that deposit money *his* or *yours*? . . . ★ Can you expand a plant after they've *zoned* around you? . . . ★ Why is it pertinent to know the meaning of *"market"*? . . . ★ What is the *"vehicle factor"* in classifying route deliverymen? . . . ★ What is the judgment on *aeration* in food spoilage cases? . . . ★ Does an injured man stand to get both wages *and* compensation? . . . ★ And how far can the FTC go in regulating advertising phrases?

LEO T. PARKER
Attorney at Law, Cincinnati

Whether invited or not, particular legal perplexities keep rising to cause concern to people in the food field—as this writer learned in talking with FE readers during his recent travels through several Eastern states.

Accordingly, notes on different queries from processors, buyers, and sellers of food products were later compared with recent higher court decisions. And it was found that a good number of the judgments throw clarifying light on the questions.

Seven such instances are detailed in this article, with facts specifically brought out to help readers map courses which will avoid the legal shoals—or, failing that, which will assist them to "come clear" if they are already in troubled waters.

Status of Your Deposit Money

One man asked: "If a processor deposits money with a food seller to guarantee acceptance of merchandise, what is the legal status of this money?"

According to a recent higher court, money thus "deposited" with a seller must be kept separate from other funds, and not used by the seller for any purpose until the purchaser receives delivery of the merchandise.

For illustration, there is the case of *Wolas v. Crescent Commercial Corp.* (195 Pac., 2d, 471), wherein a purchaser deposited $3,050 as advance payment on several hundred cases of goods, delivery to be made in the future.

Thereafter, a disagreement arose, whereupon the purchaser sued the seller for the $3,050, claiming this money was in the nature of a trust fund to be returned to him if there were failure to deliver the agreed amount of merchandise.

But the seller argued he had a right to use the deposited money for any purpose.

Here, the court stated that "the word 'deposit' in itself conveys the idea of a conditional delivery and is universally so understood. At all times it remained the money of the plaintiff (purchaser). And the possession by the defendant (seller) was as a trustee for the plaintiff, or else as a mere depositary."

Thus, the buyer was upheld. And it was borne out that a seller's breach of contract called for him to return the deposit to the purchaser and pay the damages sustained.

Zoning vs. Plant Expansions

Another man queried: "If a manufacturer of foods wants to enlarge his plant, can he do so where the plant is in an area restricted by a new zoning ordinance?"

Here, a higher court has decided that although such a food company can continue doing the *same* business irrespective of new zoning laws, it cannot, however, use the premises for any new business, nor can it enlarge the plant.

For example, in *Everpure Mfg. Co. Inc. v. Board of Appeals* (86 N. E., 2d, 906), the testimony brought out that after the company in question had been in the one business of manufacturing its products in the city for many years, the city then enacted an ordinance exclusively classifying the district in which the plant was located for residential purposes.

Since the company had been established there before the ordinance was passed, its current business was thus not affected. However, to make more profitable use of its premises, it desired to enlarge its plant and accordingly filed an application with the building inspector for a permit.

But the building inspector refused the permit.

The higher court approved the inspector's ruling. It emphasized that any new additions, enlargements, or modifications would violate the ordinance.

Need to Define "Market"

Considerable discussion has arisen over legal aspects of the term "market." That is, just what does it include?

Recently, a higher court gave an answer. This was relative to the Motor Carrier Act's exemption of vehicles from tax payments where such vehicles are used for moving fruits, green vegetables, and sugar beets from the farm or orchard to the "market."

The court held "markets" to include wineries, canneries and other such processing plants.

Specifically, in *Welch Grape Juice Co. v. McCarthy* (64 N. W., 2d, 624), the testimony detailed how Welch purchases grapes both in Michigan and Ontario, Canada, and then processes them in its plant at Lawton, Mich. The movement to the plant of the crop takes but a few weeks' work by a transportation company employing 60 trailer-and-truck units.

In this instance, the Public Service Commission of Michigan pointed to the company's lack of a certificate of public convenience to transport the grapes through the state. And there followed seizure of some of the trucks and arrest of their drivers.

The company subsequently paid $2,805, the amount of the fees, and then it sued the Commission and the State to recover this amount.

During the trial, attention was drawn to the Motor Carrier Act's specific exemptions of vehicles from tax payments (as noted above).

In reply, the Commission contended that the trucks transporting the grapes directly to the Welch plant were not, in effect, being used to transport the grapes to the "market." Therefore, it argued, the trucks were not exempt from regulation.

Yet the court disagreed and ordered the commission to refund the collected fees, saying:

"The word 'market', as used in the statute, has been interpreted in the broad sense. Rather than meaning a specific location for public sales to purchasers, the word has been taken by the administrative authorities to include a winery, a canning factory, a processing plant, or other manufactory to which fruits, vegetables, and sugar beets are transported for final disposition."

Re Standing of Deliverymen

Another matter: "Does the status of men who operate food-delivery routes differ according to whether they or their companies furnish the vehicles used? In short, when are these men legal company employees and when are they independent contractors?"

This 'vehicle factor' poser is now illuminated by a higher court, the case being *Ice Service v. Goss* (212 S. W., 2nd, 933).

In this instance, the court was asked to decide whether the company must pay unemployment compensation tax on its ice deliverymen. Confirming them as legal employees would mean that this and other taxes were to be paid. But if they are "independent contractors", the company need not pay.

The testimony pictured how the company sold ice to certain delivery men who supplied their own transportation. However, the company furnished vehicles to others for the consideration of a higher price on the ice.

Here, the court held that the deliverymen who furnished their own vehicles were independent contractors, and so no unemployment tax need be paid relative to these men.

But, said the court, those deliverymen who operated vehicles furnished by the company could not be considered independents, and therefore the company must pay such charges as unemployment and social security taxes relative to them.

The decision pointed out that "all vehicles supplied by the company were maintained and serviced by it, and the relationship of master and servant existed."

Liability With Perishables

Sought by another man were instances of legally applicable particulars that a shipper may use to demonstrate whether a carrier or warehouseman is negligent and liable for food spoilage.

On this there may be cited a specific circumstance wherein a late higher court held that if a carrier or warehouseman fails to provide ade-

quate air spaces around perishable merchandise there is negligence and, therefore, may be liability relative to the spoilage of food products.

The case is that of *Lopeman v. Kettegas Storage Co.* (245 Pac., 183), which concerned a warehouseman's failure to have adequate space for circulation of air around stored onions. The evidence here proved that the warehouseman piled the sacks of onions very high and in close formation, which caused them to "sweat" and become damp and moldy.

Subsequently, the higher court held the warehouseman liable to the owner of the stored onions for their full market value.

This court further declared that a warehouseman never is entitled to payment of storage charges on goods which are damaged through his negligence.

Limit in Compensating Injured

Concern was also expressed over this question: "If our company continues to pay wages to an injured employee, can he also receive compensation under the State Workmen's Compensation Act?"

According to a higher court, an injured employee is barred from receiving compensation under the State Workmen's Compensation Act if testimony shows that he accepted wages from his employer while suffering from his disability.

The reference is *Olney Co. Inc. v. Industrial Commission* (88 N. E., 2d, 24), which revolved around an employee of a food products company who was seriously injured when loading a truck.

Immediately after the accident, this man felt a pain in his right side. But after resting, this pain abated, and he remained at work the rest of the day.

However, the following day a lump had risen in his right groin and, though he tried to work, he could not do so, and was told by the company's manager to see a doctor. And this checkup revealed a serious disability.

The company continued to pay this man's wages during the period of this disability and until he was able to return to work. Then, later, the employee sued for compensation under the State Workmen's Compensation Act.

The court, however, refused to hold in favor of the employee, saying: "The wages paid to this claimant (employee) must be deemed to have been under the provisions of the Compensation Act. They constituted payment of the compensation to which this claimant was entitled under the Act for temporary total incapacity, and operated to satisfy in full his monetary liability, since the sum he was paid was greater than the weekly compensation allowable."

On Fraudulent Advertising

Finally, a processor asked: "What does the law say on false advertising? What must be proved to convict a food manufacturer of advertising fraudulently in interstate commerce? And who makes the decision?"

The Federal Trade Commission Act gives the Commission authority to prevent persons from using unfair or deceptive practices in commerce, such as false advertisements. And a late higher court has held that false advertising includes failure to reveal certain characteristics of the product that are important either because of representation in the advertisement, or because of consequences which arise from the use of the product.

However, it is to be particularly noted that the Commission's power is limited.

For example, the case of *Alberty v. Federal Trade Commission* (182 Fed., 2d, 36) disclosed how a company which makes and sells food items had

(Turn to page 198)

¶ Here's an article to set back the pessimists.

¶ It clearly demonstrates that there is no more potent force for building your company than your own plant personnel.

¶ And the only trick to it is to "give them the green light"

FE STAFF

Employees' Committee: *Put over plan . . .*

Workers Boost

Status of the Stag brewery of Belleville, Ill., was "fair to middling" back at the start of May 1954.

But to the employees, themselves, this was far from good enough.

They were aware that a number of smaller beer plants had been falling by the wayside over the years. They simply couldn't see Stag following suit. They felt that their brewery—and their jobs—merited a lift.

And appointing a worker committee of ten, they determined to provide that lift.

Minds of these committeemen—mostly union representatives—weren't on GAW, company assurance of jobs, or full pay even when production slipped. Instead, their proposition was "an elaborate employee-sponsored program to make our jobs more secure by winning friends and customers for the company."

Management's response was both wholehearted and wise. It not only backed the empolyees' program to the limit but it also astutely avoided pre-empting the initiative. It left matters up to the employees to "do it themselves."

▶There followed a striking promotion that saw the employees build up their own morale into a strong new force, that made plant cooperation a No. 1 factor, that "sold" the organization to the worker families, as well as "consolidated" the dealers.

▶In fact, so great was the impetus that the "Stag Story" radiated far beyond its original concepts and became an area-wide booster program backed by both the mayor and chamber of commerce. Result was the solid entrenching of this plant in the top rank of community establishments.

This is the story—

The employee committee suggested a two-week program aimed, first off, to convince Belleville that Stag was vital to the community's well-being, in fact to its very existence. Then, second, there was to be an endeavor to "sell" retailers, distributors, and tavern owners on the contribution of Stag payrolls to the stability of the community and its various businesses.

Third, an effort would be made to impress stockholders and VIP with the outstanding merit of both the company and its product. And finally planned was a move to spur employees and their families to further aid in improving the competitive situation of the company.

Making It Tick

Under the program, management and employees were to serve together on all of the planning committees. Employees and their families thereupon executed the plans—all willingly contributing many evening and week-end hours. Management, of course, footed the bill for promotion and entertainment.

Here's what the employees prepared for the "Let's all brag about Belleville and Stag" promotional campaign.

A variety of three-color display material, including placards, window stickers, pennants, car bumper signs, and oversize lapel buttons, all bearing the "Let's Brag" slogan.

Provision was made for employees to post the display materials throughout the area. At the same time, the brewery also put up 24-sheet outdoor posters in strategic locations.

Pamphlets were made up to supply information to the press and radio station, and also directly to members of the community.

One of these gave facts to justify bragging about Belleville. Another detailed the history of the Stag brewery and its contribution to the community welfare.

An additional idea accenting the importance of the brewery to the community was making up half the weekly payroll at the plant in silver dollars. Subsequent movement of these "cartwheels" in local trade would demonstrate the payroll's influence.

Also worked out was a series of parties and tours of the plant. Among the groups to be invited, according to the original plan, were local tavern owners and package store operators, employees and their families, and the local stockholders of the brewery.

Belleville "Climbs Aboard"

Word of the brewery's extensive program quickly reached the community and civic leaders. The Stag employees' committee and company officials were then highly gratified when they were approached by a committee of retailers from the community with a proposal to make the "Let's Brag" promotion city-wide.

Acceptance of this offer not only increased the respon-

. . . that drew many thousands of visitors and made them company friends

Company—And Their Own Jobs

sibility of the committee but also added materially to the efforts of individual employees to make the whole campaign a success. Wheels were soon set in motion to tie in Stag's program with a two-week promotion among industries and merchants throughout the city.

Representatives of these groups met at the brewery for a briefing and explanation of the plans. And thereupon additional display materials for store fronts, and also street banners, were made available—by the brewery, of course, at no cost.

Then the city likewise adopted the silver-dollar idea, whereupon portions of payrolls all over the area were made up in silver. All told, more than 100,000 silver dollars were distributed over the two-week period.

This striking "rain of silver" got a special play from Belleville merchants. They arranged sales tied to the "large silver."

Some of these items could be obtained at discounts of 25%—provided the purchase money included one of these dollars. Many other stores had bargains buyable only with the big coins.

Merchants reported this promotion upped their sales volume 20 to 25%. Some rises were even higher.

Good Press

Almost every day, the two Belleville newspapers carried front-page stories. Each printed lists of reasons why readers should be proud of their city. Editorials on the promotion appeared in both papers. And the "Letters to the Editor" columns were dominated by readers' comments on the "Let's Brag" idea.

The TV and radio stations in Belleville carried interviews with members of the Stag employees sponsoring committee, along with various promotion items.

Congratulations and thanks to the committee were time and again repeated by city and chamber officials.

Facing the problem of handling the large groups visit-

"SPECIAL IMPORT"

Transitional trends in today's brewing field lend special import to the accompanying article.

There are now approximately one-third fewer breweries than 10 yr. ago. Large plants have grown larger, and meanwhile some 150-odd smaller ones have closed their doors.

As early as 1952, ten breweries were accounting for better than 40% of the national beer volume, according to the 12th Annual Brewery Industry Survey conducted by Research Co. of America.

There are a number of factors for a brewery to conjure with. For one thing, the cost of modernizing. For another, the wherewithal it takes to meet the demands and competitive grappling needed to put over the new "packaged beer."

▶ Stag of Belleville, however, found out it had something else—outstanding support of its own employees based on strong belief both in the company and the product.

The depth of this belief is reflected in the story that is recounted above.

Founded in the mid-19th century, Stag has upped its production to 700,000 bbl. a year. It was the first brewery to equip its lager cellars with all-stainless steel tanks. And its capital investment per employee is more than $10,000, while its payrolls run 12% of the Belleville community total. Since the events described here, Stag has become a member of the fast-growing Carling Brewing Co. of Cleveland.

—The Editors

STAG'S VITAL CASH CONTRIBUTION in area was impressed on community by lively circulation of silver dollars spread via brewery's payroll. Various merchants employed "big eagles" in attractive sales tie-ins.

ing the brewery, committee members appealed to the wives of the employees, who readily volunteered to serve as guides, hostesses, and caterers.

The employees themselves volunteered almost 100% to handle the heavy work, which included erection of a huge tent, along with the task of supplying tables and chairs, and also the distribution and posting of streamers and promotion material.

Called for were three days of plant visits. First came Employees' Day, given over to conducting employees and their families through the establishment and serving refreshments.

The second day was devoted to tavern owners and distributors. And the third day was Stockholders and VIP Day including an evening meeting and entertainment.

The community's request to participate was accompanied by a call for a number of more days of public tours.

Calendar Aspects

Planning started the end of May 1954. By June 28 the empolyee statement was released, followed on the 29th by a release of the mayor's and chamber's statement. By July 8 literature was distributed and the brewery's silver dollar payroll inaugurated. Then, July 11-13 saw the three special visiting days. These were followed by the public tours (July 14-24).

From day to day, bulletins from the employee committee advised company personnel of developments to date, progress achieved, and coming plans.

They told how some 4,000 persons were attracted to the plant for the three special days, capped by some 10,000 visitors from the general public in the immediate and adjacent area.

There could be no better proof of the promotional pudding–most notably pointing up the values to be gained when your team has the spirit and you give it full rein.

These Ad Elements Rang the Bell in Belleville

Let's all brag about Belleville..
JULY 8TH - JULY 24TH
Stag BEER
Thanks
to our employees who originated t
An Invitation
to all residents of Belleville to join in this tribute to
FRIENDLY SILVER DOLLARS
LOOK FOR THEM!
NOTE TO MERCHANTS —
Herman Zacharski, ADams 3-1234.
BE OUR GUEST —
THE WHOLE TOWN'S BEHIND THE IDEA!
CITY OFFICIALS, CHAMBER OF COMMERCE, MERCHANTS, BANKS, NEWSPAPERS, RADIO-TV STATIONS, INDUSTRY
Belleville News-Democrat
BELLEVILLE DAILY ADVOCATE
Belleville Residents Have Much to Brag About!

"Think" they did . . . . . with this result

STORY IS TOLD by views of old vs. new. Left: Open-metal shelving, from which uniforms were formerly issued by stockroom attendants, provided a hodge-podge leaving much to be desired. Right: New automatic dispenser keeps all garments ship-shape, and no attendants are required. Employees have individual key-opened lockers.

Lockers Now Dispense Their Uniforms

—saving valued time of workers . . . assuring them "right" garments that fit . . . reducing item losses . . . and removing the old pressure on the stockroom

FE STAFF

Installation of an automatic clean-uniform dispensing system at the Hoboken, N. J., Central Laboratories of General Foods Corp., is paying three very distinct dividends:

1. Considerable time of laboratory employees is now conserved.

2. Employee satisfaction and morale are enhanced.

3. Fewer garments are lost.

Formerly, the uniforms were issued by the attendants in the laboratory equipment-and-supplies stockroom. But serious weaknesses were inherent in this system.

When in need of clean uniforms, workers had to make a trip to the stockroom on company time. And here they very often had to wait until an attendant was free to serve them. Then the size of shirt and trousers that fitted had to be located in the piles stacked on the long seven-shelved racks. Also necessary was tedious record keeping.

Such garment dispensing, it was determined, required approximately 20 man-hours per week. Therefore, it was found advisable to limit uniform dispensing to specific periods so it wouldn't interfere with laboratory efficiency by holding up equipment and supply withdrawals from the stockroom.

True, a number of the lab workers (with company sanction) have worn their uniforms to and from work, making the appearance of their work garments unusually important to them. Nevertheless, the abandoned system provided little if any incentive to encourage care of work clothing.

As was to be expected, the garments issued were at times almost new, but in many instances were worn and mended. Occasionally, too, the uniform did not fit as well as the wearer might like.

The new way involves use of a special type individual locker cabinet (purchased from the Change-O-Matic

(*Turn to page* 204)

How Phosphates Can Benefit Meats

By changing pH, they increase water-holding capacity. And in surface effect on fats, they appear to improve emulsification, while minimizing "pockets." But —they won't upgrade a poor meat product

ROY E. MORSE
Director of Research, Wm. J. Stange Co., Chicago

Investigations over the past decade indicate that phosphates merit a place in meat-processing techniques.

And if the "why" is understood, this place can be correctly assessed.

Specifically, two different fields of application have been recognized—(1) cooked, whole meats, such as hams and picnics; and (2) cooked, cured comminuted meats.

These applications vary to such an extent that they shall be separately discussed. As for whole meats, gage of the activity is the fact that many patents have been issued. And in active use are two—U. S. Patent 2,513,094 (dated June 27, 1950), assigned to George O. Hall, of Hall Laboratories (Calgon, Inc.), titled *Curing of Meat to Inhibit Undesirable Color Change*; and U. S. Patent 2,596,067 (dated May 6, 1952), assigned to George Brissey, of Swift and Co., titled *Preparing Cooked, Cured Meats*.

About the Patents

The Hall patent* claims that by use of molecularly dehydrated phosphates in the group $R_2O:P_2O_5$ molar ratio 1.7:1, where R is an alkali metal such as sodium or potassium and hydrogen or ammonium, undesirable change in color of cured meats is inhibited. The phosphate may be either glassy or crystalline.

It should be noted that this definition covers most available phosphate salts, including the meta and pyro salts. This patent also points out that the acid pyro salts have been found to be ineffective.

Throughout the patent, emphasis is placed upon the effect on pH and, as will be borne out, this is extremely important.

The Brissey patent** claims the addition of a mildly alkaline salt to change the pH of the meat and thus reduce the "shrink" or "purge" or "cookout" from smoked or canned hams, or other cooked, cured meat pieces.

Principal application of phosphates in whole pieces has been in hams, especially those canned. This has been permitted by USDA (Meat Inspection Branch Memoranda No. 190, Apr. 13, 1954) in hams, shoulders, and other cured pork cuts. Limits are 5% in the pickle and 0.5% in the finished product. And a further promulgation (Memoranda No. 199, Aug. 3, 1954) covers canned chopped ham, allowing use of 8 oz. of phosphate per 100 lb. of fresh, uncured comminuted ham.

Preparation Details

Instructions call for dissolving 20 lb. of sodium tripolyphosphate in 20 gal. of cold water. The phosphate is added slowly, with continuous stirring. Complete solution is important before the next step—adding curing ingredients and then saturated brine to make up 50 gal. This brine will have a salometer of about 80 deg.

Another method employs dry salt, starting with 40 gal. of cold water, to which is added 20 lb. of sodium tripolyphosphate. At complete solution, curing ingredients and 80 lb. of salt are added. Ingredients are stirred to dissolve them, and cold water is added to make up to 50 gal.

These solutions are stable at cellar temperatures for one or two weeks.

It is important not to go above a salometer reading of 85 deg. using

BOTH WHOLE AND GROUND MEATS have figured prominently in the widespread phosphate researches.

* Available for use by payment to Calgon, Inc., Pittsburgh, of a royalty, usually based on pounds of phosphate used.
** Thus far not available for license.

phosphate salts, since precipitation will result. Stainless or wooden equipment is recommended.

The Brissey patent calls for the use of any mildly alkaline salt, which produces a measurable increase in pH. There are available many inorganic salts that will perform this function, but it is understood that the choice salt is disodium phosphate.

Dr. Roger Wilson, of the American Meat Institute, has reported on work with four phosphate salts in pumped hams.[3] Here, there was no apparent gain in weight. But treated hams appeared firmer and drier when cut than did the controls. Hams treated with sodium tripolyphosphate had the best color of all. No difference in flavor or odor could be detected between controls and phosphate-treated hams.

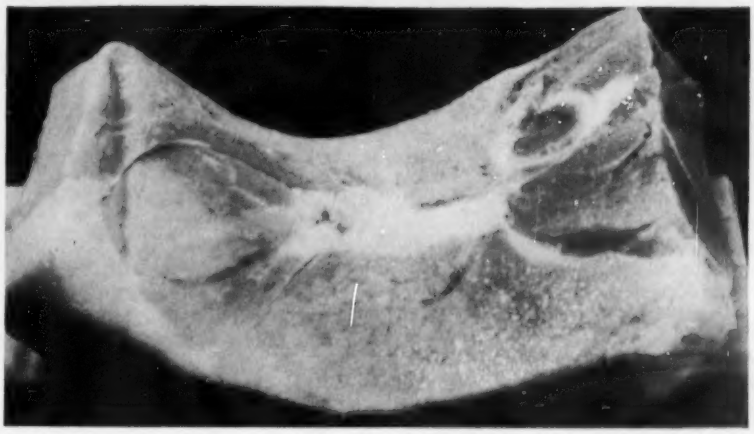
Commercial Application

These processes involving use of whole pieces of meat are now in general use in several packing houses, especially for canned hams. Advantages claimed include less cook-out of juice, with carefully controlled experiments showing this can run as high as an additional 5% retained juice. Also cited is improved ham color. And finally, the hams, though higher in moisture, have a dried appearance when cut.

First, a discussion of comminuted meats, then some special emphasis on developments in Germany, and finally a few postulations on why phosphates do what they do:

Results obtained from the use of phosphates in comminuted meats are somewhat difficult to establish. For we are dealing with some factors—"binding quality" and "fat-pocked eliminating"—for which, as yet, we have no yardsticks. However, there have been some controlled test runs which point to advantages in certain cases.

Revealing Comparison



DIFFERENCE is sharp. Top: Treated ham remains firmer. Above: Untreated meat sags and is more moist. (Reliable Packing Co. photo)

Much of this work is being done in Germany in the wake of a "hot" controversy there on this subject. Whereas two states, Lower Saxony and Hesse, have permitted such use of phosphates,

7 Application Points Spotlighted

In the search for common denominators in applying phosphates to meats, several trends have been noted.

These have appeared repetitively in the work, which has been carried out in many places and has been marked by a number of different approaches.

1. There seems to be a general agreement that pH adjustment of intact meat to 7.0-7.4 enables meat fibers or protein to take up and hold their normal water content. On the other hand, meat that approaches its iso-electric point (pH 5.5) loses water and water solubles. The use of a phosphate salt producing this pH is, therefore, helpful.

2. Other salts, including citrates and lactates and table salt, can aid in producing this imbibition effect.

3. Although certain phosphates (especially the long chain inorganic polymers like Calgon and Kurrol's salt) have a marked effect on viscosity in aqueous solutions, most workers doubt that the beneficial effect of phosphates is due to viscosity increase.

4. Even though certain phosphate salts, especially trisodium phosphate, are good aids to emulsification, there is considerable doubt that the effect on fat is the principal benefit to be derived from such employment of phosphates.

5. In addition to the increase in water-holding capacity brought about by pH change with the use of phosphates, there is undoubtedly some effect upon the surface charge or surface characteristic of meat proteins. Both Van Wazer and Hamm have discussed this. If this surface effect is also exerted on fat particles, it could explain the better emulsification and fewer fat pockets.

6. The citrates and phosphates showing best results in comminuted meats are also good metal-sequestering agents. It may be that sequestration plays a part in helping protein swelling. Hamm suggests this in reporting two different salt effects, one of which is manifest as binding (or sequestering) magnesium and calcium from the meat.

7. While the effect of added phosphates is helpful, careful meat-plant operating practice is important for good quality sausage products. Use of phosphates does not upgrade poor quality materials or gloss over faulty practices such as inadequate chopping or mixing. Phosphates can, if used properly, make a good product better, but cannot make a poor product good.—*R.E.M.*

the others are in the midst of an argumentative review.

At Giessen (Hesse), Prof. H. Keller has used Fibrosol (a proprietary mixture), monosodium orthophosphate, sodium metaphosphate, and trisodium phosphate at a 0.5% level in hog-casing sausage.[2]

Interesting German Findings

He found that trisodium phosphate emulsified fat well, gave less cooking loss, but contributed a 'soapy' taste and was, therefore, unacceptable. Sodium metaphosphate resulted in less cooking loss, less fat loss in cooking, and fewer fat pockets than untreated control.

Further: Monosodium gave higher cooking weight and fat losses. Fibrosol was found to be similar to meta in reaction.

He pointed out that the processing procedure was extremely important. Thus, finely chopped and well-mixed sausage showed lower fat and weight losses than similar material less carefully processed. With the latter, coarseness and inadequate mixing were held responsible.

pH Plays Big Role

Incidentally, an article published during this controversy has pointed out that phosphates are being exported from West Germany for use in meats by Holland, Belgium, Austria, Denmark, England, and the U. S.

In another pertinent article, Prof. R. Grau, of the Federal Meat Research Institute at Kulmbach, has defended use of phosphates in comminuted meats.[3]

Noting that the water retention of meat is dependent upon pH and mineral content, he states that at a high pH, meat has good water retention, and that this retention drops with a lowering pH and is at its lowest value at 5.5.

He said further that many salts—sodium chloride, phosphates, citrates, and lactates—produce a swelling or imbibition in meats.

Curbs Drip

To enlarge on pH: It is known that the pH of the living animal is 7.4-7.6, and life is dependent upon close pH control. Soon after slaughter, the pH begins to drop due to formation of lactic acid from blood sugar and phosphoric acid from other materials.

Specific point of minimum water retention is also the iso-electric point —pH 5.5—of the animal protein.

Dr. F. Deatherage, at Ohio State, has been investigating the infusion of an animal, at time of slaughter, so that pH is buffered at 7.0 to produce protein swelling by table salt.[4] He reports no drip in frozen-and-then-thawed steaks.

Handling Important

Further, Dr. M. Dopner has carried out a series of studies on phosphate addition to sausage.[5] In these investigations he observed that hexameta phosphates did not permit sausage meats to retain an overload of added water.

However, when the water addition was increased, more water was lost during cooking.

He asserted that the usual factors of meat type, degree of chop, and method of handling played a far more important role in moisture loss than did phosphate addition.

He could not confirm the claim that phosphate addition enabled poor sausage meats to perform like high-quality sausage meats. He did observe that phosphates added at a 0.5% level to a sausage chopper, with high-quality sausage meats, produced a loose or sloppy consistency, much like a very poor sausage batch.

"Peptizing" Effect

This effect is similar to that observed in clays and oil-well drilling muds, as reported by John Van Wazer, where the addition of phosphate salts to clays produced a "loosening" or "peptizing" effect.[6] A solid ball of clay can be reduced to a sloppy mass by the addition of a pinch of powdered sodium phosphate glass.

Less Shrinkage

Dr. Dopner concluded that boiled phosphate-treated sausage showed less shrinkage than controls, due to retention of juices during boiling.

Then, during the last American Meat Institute meeting, Dr. Wilson presented his paper on the use of additives, including phosphates with bologna.[1] Of phosphates tried, sodium tripolyphosphate and sodium pyrophosphate raised the pH about 0.6, disodium raised it 0.5, and sodium hexametaphosphate about 0.1.

Results showed that these four phosphates, when used in a comminuted product such as bologna, produced no measurable benefits relative to moisture retention, texture, color fixation, or rate of color fading.

Swelling Factor

Finally, Dr. Reiner Hamm has recently published the results of his work on the effects of different salts on comminuted meats.[7] He worked with ortho, pyro, poly, and meta phosphate salts, as well as citrates, lactates, tartrates, and regular sodium chloride. And extensive experiments were made on the effect of these salts upon muscle swelling and water binding.

Swelling was produced by phosphates and citrates due to binding magnesium and calcium from the meat, thus enabling the meat to increase water take-up. The other group of salts, including sodium chloride, increases protein hydration by immediate action.

He decided that the "phosphate effect" was due to pH-increasing and salting actions, especially at the raised pH. Fat emulsification and viscosity were considered of minor importance.

A Word On the Phosphates

Food-grade phosphates are made by subjecting phosphate-bearing ores to high temperatures in an electric furnace. The elemental phosphorus comes off as fumes, which are collected.

This elemental phosphorus is next "burned" to give an oxide of phosphorus which, when mixed with water, yields phosphoric acid.

Then, any of the desired phosphorus salts can be prepared by reacting phosphoric acid with the appropriate basic material. From the phosphate salts there can be prepared phosphate glasses or "molecularly dehydrated" phosphates by incineration under the correct conditions of temperature and cooling.

Phosphate glasses of commerce include sodium hexametaphosphate or Calgon, and potassium glasses such as Kurrol's salt.

The subject is well covered by John Van Wazer (see his *Properties and Chemistry of Phosphorus and Its Compounds*, Monsanto Chemical Co., St. Louis, pp. 403-510, 1953).

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★ **Appearance**

★ **Taste**

★ **Texture**

—of a wide range of products are brightened by this unique ingredient. And furthermore it promotes flavor release in fruit products

CLEAR GELS like this are easily made from algin solutions by addition of calcium salts. Edible films result from similar reactions.

ALGIN

Versatile Food Improver

K. F. GIBSEN and L. B. ROTHE

Respectively, Technical Director Kelco Co., San Diego, Calif., and Technical Representative, New York City

Particularly noted for their outstanding food-enhancing properties, algin products have found numerous applications over a range of items—from ice creams and sherbets to salad dressings, bakery items, syrups, quick-mix foods, and sausage casings.

In these foods they act as thickening, suspending, stabilizing, emulsifying, gel-producing, or film-forming agents without inhibiting or masking flavors.

Many of them combine two or more of the above mentioned properties, and all are readily compatible with food ingredients under all kinds of conditions.

First algin product to gain commercial prominence, and still the most widely used, is sodium alginate. It is available in high, medium, and low viscosity types that are suitable for use in a pH range of 4-11.

Propylene glycol alginate is another derivative that has attained commercial prominence within the past few years. It has unusual water thickening properties as well as pronounced emulsifying characteristics for oil-in-water emulsions.

Since it is both soluble and stable in solutions having a pH of 2 to 7, this product is specially suitable as an emulsifier-stabilizer in acidic foods such as French dressings, sauces, etc.

Other commercially valuable products are calcium, potassium, and ammonium alginates. Table II lists a number of typical food applications.

Algin is available as a uniform free-flowing granular or fibrous powder. When used in a liquid formula, it should be dry blended with a portion of other dry ingredients, such as sugars or spices, then dissolved in water with good agitation. This will result in a uniform dispersal of the ingredient and also speed subsequent solution when mixed with water.

Uses and Concentrations

The general range of concentration for foods is from 0.1 to 1.0% based on total finished weight.

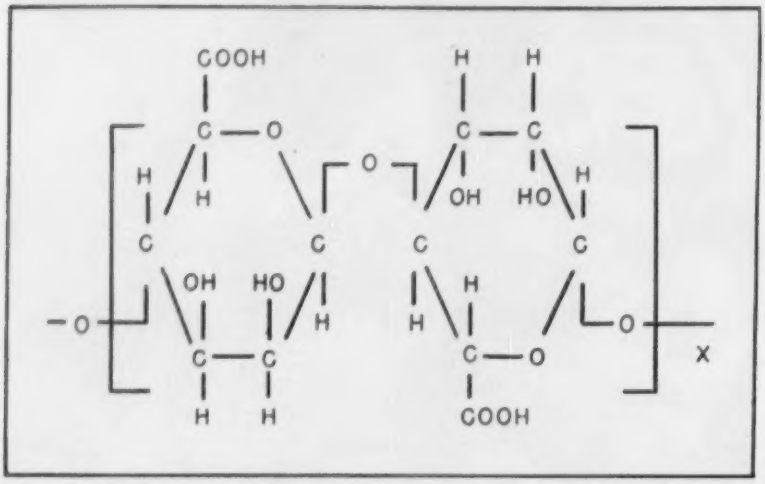
As algin is readily soluble in aqueous mediums it is used advantageously in dry blended prepared mixes. For the housewife, these products require only the addition of milk or water followed by simple mixing to form delicious puddings, meringues, icings, or dessert gels.

To maintain smoothness and resist

What It Is . . . Where It's Found

Algin is the common name for the water-soluble derivatives of alginic acid, a hydrophilic colloidal polymer of anhydro-B-D-mannuronic acid units.

Its structural formula is generally accepted as—



—from which it can be seen that alginates are sugar-acid polymers and can be classified as carbohydrates.

As a source of algin, kelp is harvested in large quantities by modern methods. Its production has now expanded to where it is the most important natural water-soluble gum produced in the U. S.

A large number of algin products are available, each being standardized to embody certain specific characteristics that make it adaptable for a wide range of food uses (see tables).

TABLE I—CHECKLIST for Selecting Forms, and Viscosities They Offer

Product	Viscosity in Centipoises At Concentrations of 1%	2%	3%
Sodium alginate, extra low viscosity	30	170	680
Sodium alginate, low viscosity	80	1,000	4,800
Sodium alginate, medium viscosity	500	8,000	32,000
Sodium alginate, high viscosity	2,000	22,000	70,000
Propylene glycol alginate, low viscosity	150	2,600	15,000
Propylene glycol alginate, high viscosity	1,100	13,000	50,000

TABLE II—TYPICAL Food Applications of Algin Products

Use	Product	Amount Used (Percent)	How Used	Purpose
Bakery jelly	Sodium alginate	0.1 of jelly	Cook with pectin	Retards syneresis. Soft, easily spread gel.
Pie filling	Sodium alginate	0.3–0.5 of total filling	Dissolve in part of water, mix with cooked starch, add sugar, fruit	Soft smooth gel body. Improved clarity, gloss. Full flavor, prevents separation, cracking.
Ice cream	Milk soluble sodium alginate	0.15–0.4	Water dispersion, dry mix with sugar	Maintains smooth texture during storage, smooth meltdown without serum drainage, improve whipping.
Confectionery gels and fillings	Sodium alginate	0.1–0.7	Dissolve in water, add sugar, cook add acid, etc.	Makes clear candy gel for tender-to-chewy eating qualities. Retains moisture, retards syrup separation.
French dressing	Propylene glycol alginate	0.5	Dissolve in water, add vinegar, oil, etc.	Uniform emulsion with long shelf life.
Meat sauce	Propylene glycol alginate	0.5–1.0	Dissolve in water, add salt, condiment, etc.	Smooth, heavy, uniform body, prevents separation.
Flavor emulsion	Propylene glycol alginate	1.0–3.0	Dissolve in water	Stable emulsion
Dessert gels	Sodium alginate	0.8	Dry mix with sugar, citric acid, etc. Dissolve in hot water.	Clear, firm gel, quick set
Milk puddings	Milk soluble sodium alginate	0.8	Dry mix with sugar, cocoa, etc. Dissolve in cold milk.	Quick, easy mix with cold milk to form smooth-firm gel in 1 hr.
Syrups, toppings purees	Sodium alginate, propylene glycol alginate	0.1–0.5	Dissolve in water, add to syrup.	Heavy smooth "body" without excessive sweetness. No masking of flavor, prevents separation.
Frozen fruit	Propylene glycol alginate	2.0	Dry mix with sugar, sift into fruit, mix.	Uniform heavy body, prevents syrup separation. Smooth texture when frozen. Bright color, glossy appearance, full flavor.
Dietetic foods	Sodium alginate, propylene glycol alginate	0.2–2.0	Dry mix or in water, add protein, etc.	Thickener, smooth heavy body.
Dry mixes	Sodium alginates, propylene glycol alginates	0.05–1.0	Dry blend	Easy mixing. Improved texture and shelf life of finished convenience foods.
Icing	Gel forming algin	3–8 oz. per 100 lb. sugar	Dissolve in water.	Quick set and drying. Non-sticking retards melting. Tender, soft body.

heat-shock on handling, frozen desserts such as ice cream require a stabilizer. And algin at a concentration of about 0.25% provides this stabilization.

The ice cream made with it shows a smooth, clean melt-down, and has a clean, true flavor.

Ice creams flavored with frozen peaches, strawberries, or other fruit, are better protected when the fruit itself is stabilized with an algin derivative.

Process can be done by the packer or by the ice cream manufacturer. For example, strawberry ice cream made by this method shows improved, smoother texture, as compared with those products made with the unstabilized fruit.

Leading sherbet and water-ice manufacturers place great value on good, true fruit flavor, firm body, and smooth texture. An outstanding characteristic of an algin sherbet stabilizer is its ability to promote superior flavor release from fruit ingredients while providing the desired body and texture characteristics.

Overrun problems are often encountered in the manufacture of these products, but experience has shown that an algin sherbet stabilizer facilitates obtaining proper overrun. The normal concentration is about 0.5% by weight of the mix.

Salad Dressings, Sauces

In the Federal definition and standard of identity for French and salad dressings, propylene glycol alginate is one of the optional emulsifying ingredients, and can be designated as

"algin derivative" for labeling purposes.

The French dressing processor has readily accepted this product because of its unique emulsifying properties. Dressings made with it have a long shelf life and resist break-down whether exposed to high room temperatures or kept under refrigerated storage.

Processing is comparatively easy since the algin derivative is quickly soluble in cold water or vinegar solution. Ordinarily, 0.5% or less of this product is required.

Salad dressings that are of soft, smooth texture can be made by adding the algin derivative as a corn starch modifier. Only 3%, based on the starch, will produce a desirable gel body that resists cracking and oil separation on long standing.

For the processor who does not have adequate cooking facilities for preparing the starch base, a quality dressing can be made with algin alone using cold water, provided good agitation is available. Here, 0.75 to 1.0% algin produces a top-quality product.

Barbecue sauce is another product benefited through use of propylene glycol alginate. It enables production of a properly stabilized, smooth-flowing product having a clean, full flavor. Similarly this algin derivative is used in meat and mustard sauces for proper body-control and stabilization.

Bakery Goods

Algin has been known as a bakery icing stabilizer for many years. It is easy to use because no special heating or boiling procedure need be followed. And it is very economical, with the usual formula calling for only 3-8 oz. for every 100 lb. of sugar. Icings thus prepared are non-sticky and will not crack or dry out during normal shelf life. These qualities are also of great importance in doughnut glaze.

When incorporated in bakery jellies at 0.1%, algin reduces syneresis and improves spreading quality. Similarly, starch pie fillings are improved, and storage life of pail fillings is increased while quality is maintained or bettered by adding a small amount of algin.

Syrups and Beverages

Flavor syrups need thickening in many instances and, of course, it is important that the thickening agent does not affect the flavor adversely. Ice cream toppings and fountain syrups made with algin give true flavor value, plus required texture, body, and flow characteristics. The same is also true of variegated ice cream syrups.

A recently developed algin product promotes foam stability in beer when used at about 50 ppm. The foam produced is composed of fine, uniform, natural appearing bubbles which resist breakdown in the presence of soap or other sanitizing agents used in washing and sterilizing glassware.

In root beer this product improves foam quality and stability. It is also an effective suspending agent in orange-pulp drinks.

Gels, Films, Mixes

Calcium salts added to an algin solution cause a thickening or gelling action to take place. This reaction can be controlled to give the desired flow or gel properties, resulting in a piping gel, a soft milk pudding, a tender candy jelly, or a shimmering water dessert gel.

When this reaction is carried out under other conditions, a useful film of calcium alginate can be formed. Since this film is edible, it has been studied as a food packaging material. Recently it has been improved to the point that sausage casings composed of it are appearing on the market (see FE Feb., p. 105).

One novel feature of algin is its complete solubility in cold liquids. This means that manufacturers of the new instant packaged mixes can obtain their dollar value of stabilization when algin is included in the mix. Great interest is being shown in algin cold-water desserts because a clear, edible gel is readily formed in about 15 min.

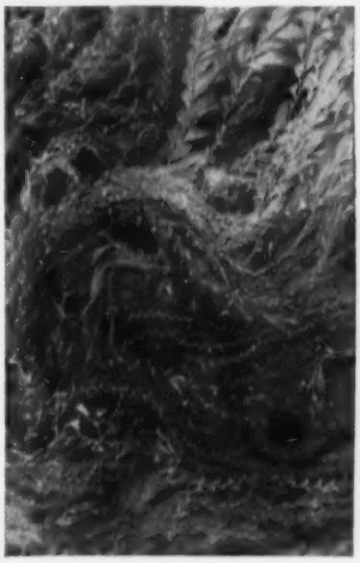
Other quick mix foods that are improved with it are cake and doughnut flours, cold milk puddings, milk shake bases, and ice cream mix powders.

Algin has a caloric value of 1.4 calories/g. or less. Since most foods call for considerably less than 1%, it is evident that there is a definite place for the use of algin in low-calories specialties.

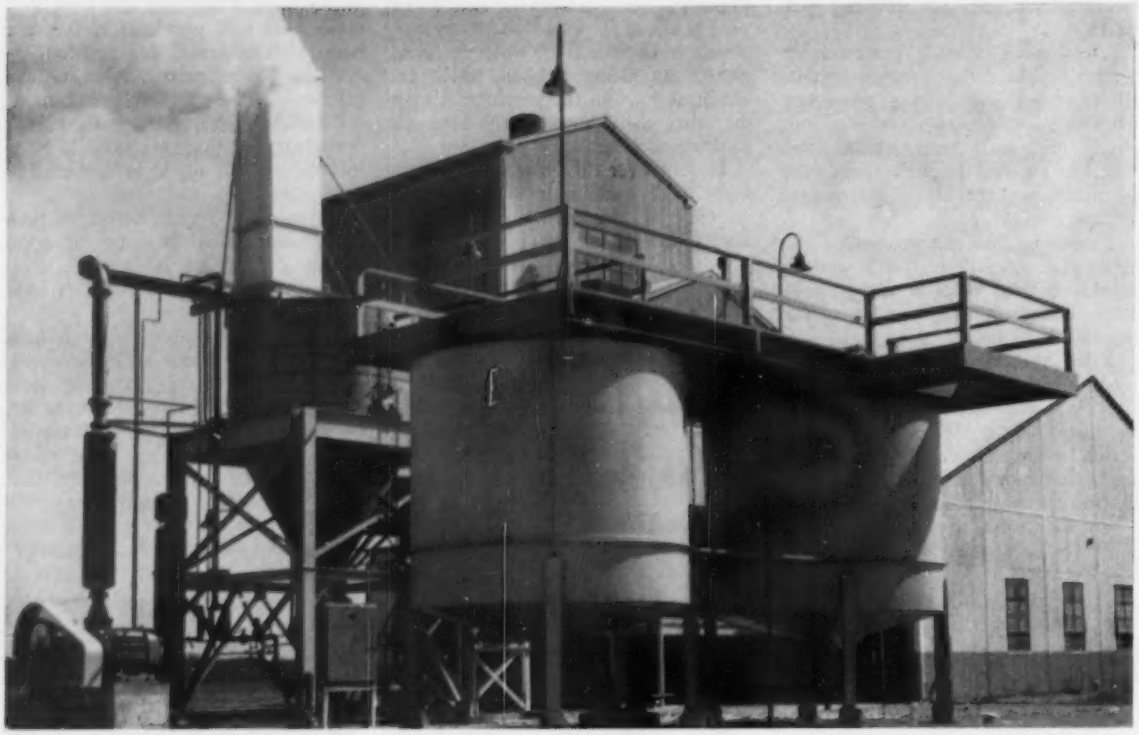
For example, syrups, beverages, puddings, and salad dressings of good quality can all be made with algin while the total caloric count is kept low.

In sugar evaporators, algin is used to control and lessen scale formation. Also, in beet sugar processing it is added at less than 10 ppm. to the settler tanks as an important flocculating aid.

It has been further suggested that these flocculating properties may aid in the recovery of other valuable foods and in the filtration of food wastes.



KELP, the giant brown seaweed from which algin is extracted, grows prolifically in Southern California waters. Below: It is harvested by boats equipped with underwater mowing and gathering apparatus.



NEW "salt-from-seawater" plant is situated on Baffin Bay about 30 miles south of Corpus Christi, Tex. It uses submerged burner in evaporator to produce concentrated slurry, rotary dryer to finish job.

Elements from Sea

Captured by New Process

Special treatment of sea water yields free-flowing salt with all of the elements in original proportions. Thus supplied is a source of valued nutrients that are often lacking in today's foods

JAMES A. LEE
Southwestern Editor, "Chemical Engineering"

Now in commercial production is a free-flowing table and cooking salt that contains all of the presently known mineral elements, and in essentially the same proportions as they exist in ocean water.

It is produced by Trace Elements Corp., Houston, Tex., in a new plant having a capacity of 100 tons per month. Company is operating under a license (U.S. Patent 2,606,839) agreement with Dow Chemical Co.

Process consists of using sea water from which solids have been allowed to settle, then straining, filtering, treating with alkali to convert part of the magnesium and calcium salts to hydroxides, with CO_2 to convert these to carbonates, evaporating to 60% solids, using a submerged combustion burner, and finally drying in a rotary dryer.

Process Pin-Pointed

Riviera, on Baffin Bay, about 30 miles south of Corpus Christi, was selected for the plant site. Determining factor was high saline content of this almost land-locked bay's water, which is practically twice that of the average sea water. In terms of salt, this means about ½ lb. is available for every gallon of the water in the bay.

As the water is pumped from the bay, it is strained, then discharged to a concrete basin where sand and other foreign matter settle out. A second straining removes additional solids before the water is pumped to a feed reservoir (see flow diagram).

As required for processing, the water is filtered and pumped into treatment tanks. Here a 50% caustic soda solution is added gradually, in a proportion equivalent to at least ½ of the magnesium and calcium salts present. Lesser proportions are insufficient to render the final solid non-deliquescent.

Carbon dioxide, or some chemical that will supply it, is injected in the

Analysis of New Sea Salt

Element	Percent
Chlorine	50.5
Sodium	27.5
Magnesium	3.4
Calcium	0.86
Sulfur	1.83
Potassium	1.13
	Ppm.
Iron	100
Copper	20
Fluorine	33
Molybdenum	0.013
Phosphorous	0.3
Iodine	1.5
Manganese	0.03-0.3
Zinc	0.15
Cobalt	0.1-1.0

Traces of most other minerals and elements.

solution to convert the hydroxides to carbonates which precipitate. Proportion of CO_2 should be approximately equivalent chemically to added alkali. This amount will produce a normal carbonate.

Carbonated mixture passes by gravity to an evaporator equipped with a submerged combustion burner. This unit comprises a nozzle-mix type burner in which gas and air are mixed below the burner plate. Above the plate, they are ignited and burned in a short, sharp, blue flame.

The burner is installed on top of the open-tank evaporator and suspended in the sea water so that products of combustion from the gas flame exhaust directly into it, through holes in the combustion chamber.

Gas travel is about 3 ft. from point of entry to surface of the liquid. As it rises to the surface, its temperature is reduced from approximately 1,200 deg. F. to that of the water. Boiling results with production of a slurry containing approximately 60% solids.

The slurry is piped to a Monel-lined rotary dryer. Before it reaches the dryer, however, fines from previous batches of salt are added, raising the solids content to about 95%.

A rotary dryer has the advantage over other type units in that it tumbles the product during drying, producing a desirably uniform and small crystal size. Salt may be heated at 200-400 deg. C. with free access of air to burn off final traces of organic matter. However, temperatures high enough to decompose the magnesium and calcium carbonates should be avoided.

Dry salt is then screened, with oversized crystals passed through a crusher and returned to the product conveyor. Fines are recirculated to the dryer feed. Final product (approximately 75% common salt and 25% trace elements, see table) is conveyed to storage bins and packaging. About 0.4 lb. of salt is produced from a gallon of the Baffin Bay water.

Wide Distribution Planned

The non-deliquescent, non-caking mineralized salt is now on sale in department and grocery stores in Houston, Corpus Christi, Chicago, Philadelphia and Nashville, and will soon be available in other cities. It is packaged in 9 and 18 oz. bottles and can be obtained in bulk.

While no specific nutritional claims are being made by the company, it does point to the importance nutritionists and agronomists have attached to iodine, iron, copper, fluorine, cobalt, magnesium, zinc, particularly in areas of the country where foods are grown in such mineral-deficient soils.

Further, although it is admitted that the average diet seems to contain adequate quantities of trace elements, it is almost impossible to say just what is "the average diet". For example, under today's highly complex distribution system, some foods may be entirely adequate in mineral content, whereas others may have come from soils somewhat lacking in certain mineral balances. Similarly, over-refinement of some foods may cause at least a partial mineral loss.

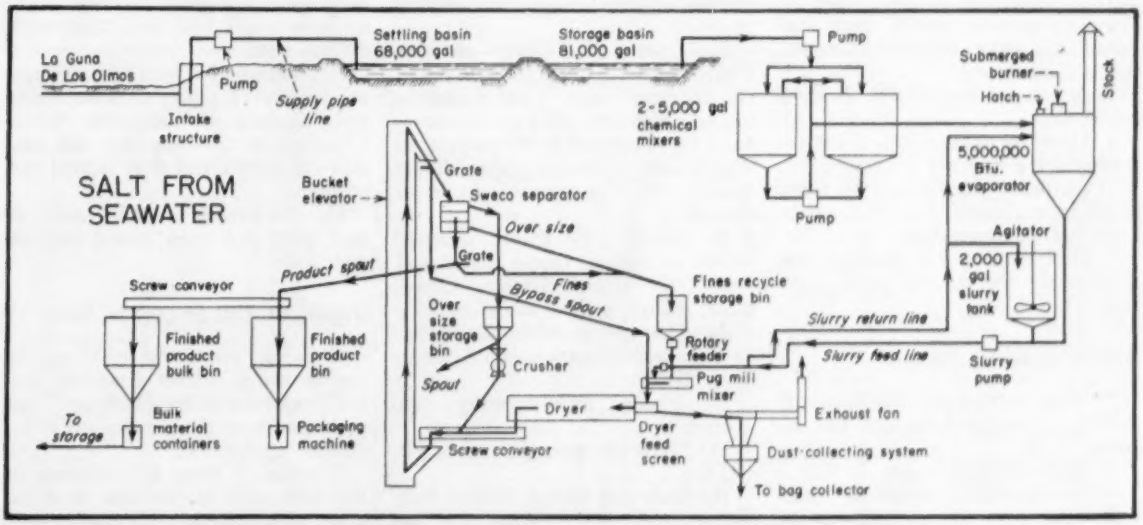
Extensive research into other products of the sea is presently underway by the company, but at this time no additional products are ready for commercial production.

Role of Trace Elements

Many of the elements found only in very small amounts in sea water are known to be essential to plant and animal life.

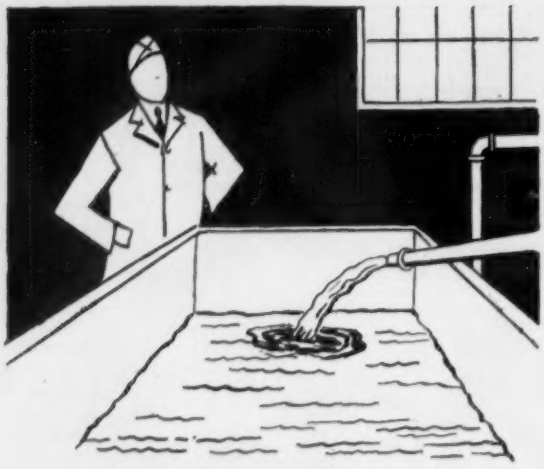
This is particularly true of cobalt, fluorine, manganese, iodine, copper, iron, zinc, and molybdenum, even though the actual requirements for them is extremely small in terms of daily intake.

Function of these trace elements is that of a catalyst in the human metabolism. They are also associated closely with enzyme, hormone, and vitamin activities. As research groups continue to expand their study of human nutrition, it is believed likely that trace elements other than those mentioned here will prove of importance in the life function of man and animal.



STEPS IN TEC'S preparation of new salt are traced in this schematic. Fundamental is addition of caustic soda and carbon dioxide in the two mixers (depicted upper right). Then brine flows by gravity to evaporator.

★ Low-count skim milk . . .



★ Sterile low-pH rinse . . .

Dozen-Day Shelf Life

S. L. TUCKEY
Department of Food Technology,
University of Illinois, Urbana

True, creamed cottage cheese is highly perishable. But you can very decidedly augment its keeping quality —and so win top-profit advantages— if you devote strict attention to its proper manufacture.

Called for in accomplishing this is special emphasis on: (1) Quality of the raw product, (2) processing techniques, and (3) sanitation procedures.

Indications that inadequate consideration is being given to these factors came to light in a recent limited survey of cottage cheese sold in supermarkets in central Illinois (Table I). Then comparable results were obtained in a more comprehensive survey in Connecticut.

Inspection of the data in Table I reveals that:

1. Microbial contamination was excessive in the majority of samples.
2. Chemical composition was more carefully controlled than the microbiological contamination.
3. Weight control of packages was not closely checked by plant operators.

Quality Reducing Factors

Now let us consider the causes of defects in cottage cheese and the ensuing results:

I. Bacteria, yeast, molds

A. Psychrophilic organisms (bacteria that grow at temperatures of 40-50 F.).

These produce: (1) Flavor changes: Fruity, bitter, putrid, or rancid; (2) Color changes: Yellow to brown on surface, or from opaque to translucent (similar to tapioca); and (3) Changes in body and texture due to hydrolysis of curd by proteolytic enzymes produced by certain species of these organisms.

B. Coliforms: (1) Flavor changes due to these organisms generally occur in raw milk prior to pasteurization, but they may result from contamination and growth during the ripening and setting period. Flavor is characteristically "unclean," peculiar to coliform organisms; (2) Body defects may be "open" or "pin holes" if contamination is very heavy. These become apparent during the cooking period.

C. Yeasts: (1) Flavor changes: Fruity, yeasty, fermented, and bitter; (2) Abnormal colors if the organisms produce pigments (pink is a common one); (3) Abnormal body—gassy, open (this is rare in cottage cheese during storage, but more common in cream cheese).

D. Molds: (1) Flavor changes: Musty or moldy, rancid, bitter and fruity; (2) Color changes: Green, black, orange, yellow, white, etc., depending on species of mold. Sources of these contaminations are listed in Table II.

II. Faulty manufacturing procedures

(A) Flavor changes: Acidy, sour, bitter, flat.

(B) Body and texture defects: Soft, pasty, tough, and rubbery, dry and mealy.

(C) Abnormal color is produced if regular spray process powder is used instead of low-heat powder, or if artificial color is added.

III. Alkaline chemical compounds

(A) Alkaline salts in wash water tend to make a soft, weak body. If pH of washwater is 7.0-7.6 or higher, water should be acidified with acid (C. P. HCl) for 2nd and 3rd washings to prevent development of a soft slimy film on surface of curd.

(B) If ammonia laden air comes in contact with cheese curd, body becomes soft and the color translucent, due to formation of ammonium caseinate.

(C) Alkaline salts used to standardize acidity or increase viscosity in dressing may increase pH sufficiently to cause a soft body and translucent colored curd.

(D) Phenol (0.1 ppm.) in presence of chlorine (1 ppm.) in wash water will produce a medicinal flavor. Chlorination (10-15 ppm.) will oxidize the phenol and thus prevent the off-flavor.

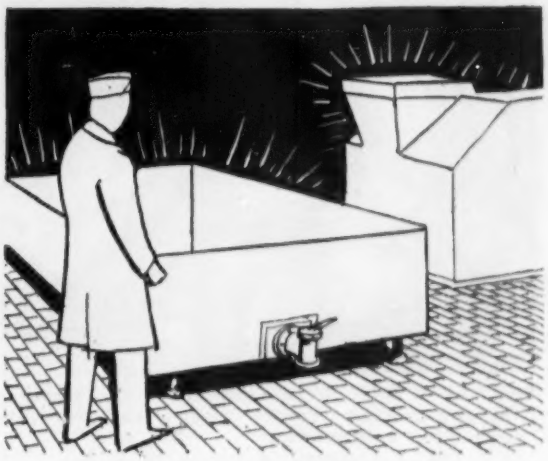
IV. Off-flavors in milk, such as feed, garlic and onion, rancid, unclean and malty

Organisms Tell Sanitation Story

Coliform, yeast, and mold counts can be used as indexes of sanitary control procedures in the plant, since the main source of these organisms is insanitary equipment.

However, if there are coliforms in the skim milk at the time it is inoculated for cheese, the number will be considerably greater after incubation at 70 F. for 12 hr. when the

★ Quality cream and flavors . . .



★ And spic-and-span units assure—

For Cottage Cheese

curd is cut. This is illustrated by results of tests made on two vats of skim milk:

	Coliforms Per Ml.
Vat No. 1	
At time of setting (70 F.)	3
At cutting 12-hr. later (72 F.)	10,000
Vat No. 2	
At time of setting (70 F.)	0
At cutting 12-hr later (72 F.)	450

Not only will coliforms, yeast, and molds grow during the setting period, but they will also grow at the storage temperature (50 F.) of most refrigerated self-service cabinets.

Undoubtedly, some of the high counts reported in Table I were the result of this growth, but the above data serve to illustrate the importance of starting with materials having a zero count.

It is interesting to compare results of coliform counts in Table I with those reported in Connecticut Bulletin 284 (Table III). Considering the relatively small number of Illinois samples, the results of the two tests are surprisingly similar.

Data in Table IV show that a majority of the cottage cheese samples also had excessive numbers of yeasts and molds at time of purchase.

The fact that psychrophilic organisms grow at the storage temperatures (40-50 F.) for cottage cheese makes them particularly troublesome. These organisms gain entrance to the cheese mainly through contaminated equipment and via the wash water.

Water supplies may be potable from the standpoint of freedom from coliform organisms, but they may be highly contaminated with psychrophilic bacteria. If this be true, the water must be sterilized before it is used to wash the cheese.

If chlorine is used for this purpose, time of exposure is as important as concentration. Water that is free from sediment can be sterilized with 5 ppm. chlorine with a 5 min. exposure. This must be done before it reaches the cheese vat, however. Either an in-line injector or batch system of sterilization may be used.

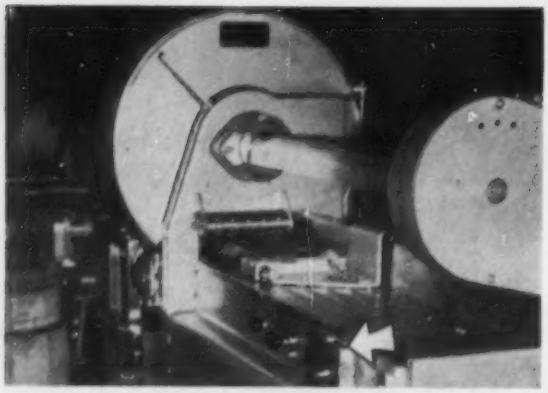
Some water supplies are now giving

(*Turn to page 218*)

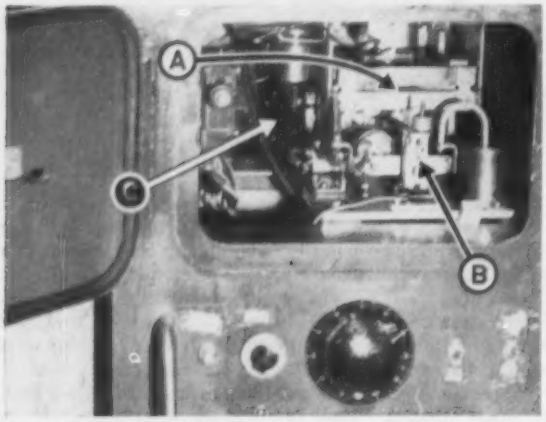
TABLE I—SURVEY Shows Quality of Cottage Cheese Sold in Retail Stores in Central Illinois

Sample*	Package Size (Oz)	Variation From Printed Wt. (Percent)	pH	Fat (Percent)	T.S. (Percent)	Moisture (Percent)	Coliforms (Per Gram)	Yeast and Mold (Per Gram)	Psychrophiles (Per Gram)
1a	16	+ .66	4.58	5.1	20.70	79.30	0	1 (1:2 dil.)	600,000
1b	16	− .44	4.58	5.0	20.60	79.40	0	1 (1:2 dil.)	3,300,000
2	12	+ .58	4.60	4.7	21.40	78.60	36	26,000	300,000
3a	12	+ 1.17	5.0	4.0	21.13	78.87	300	600	86,000
3b	12	+ 1.17	5.0	3.6	20.09	79.91	4,700	2	95,000
4a	12	+ 8.82	4.95	5.4	21.22	78.78	6,300	110	250,000
4b	12	+ 5.88	4.90	4.3	20.78	79.22	129,000	300	200,000
5	12	+ 2.0	5.0	3.8	20.44	79.56	0	1 (1:2 d.)	42,000
6a	12	+ 1.17	4.9	4.4	18.44	81.56	300,000	13,000	50,000,000
6b	12	− 3.5	4.7	4.8	18.32	81.68	900	40,000	27,000,000
7a	16	− 4.4	5.12	4.6	20.71	79.29	4,000	1,000,000	70,000,000
7b	16	+ .22	5.12	4.7	21.12	78.88	6,000	120,000	70,000,000
7c	16	+ 3.5	5.0	4.6	20.49	79.51	3,000	500,000	20,000,000
7d	16	− 1.3	5.0	3.3	22.73	77.27	18,000	3,000	30,000
8	12	−21.0	5.05	12.0	24.98	75.02	0	1 (1:10)	5,400,000
9	16	+ .22	5.05	4.5	17.65	82.35	1 (1:2)	1,200	2,500,000
10	16	+10.8	5.10	3.6	20.35	79.65	1 (1:2)	80	300,000
11a	12	+ 6.17	5.15	4.1	20.87	79.13	25	40	500,000
11b	12	− .88	5.15	3.6	20.17	79.73	34	40	20,000
11c	12	+ 9.1	5.15	4.2	20.54	79.46	50	0 (1:10)	18,000
12	16	−14.99	5.02	3.3	24.13	75.87	110	90,000	18,000,000

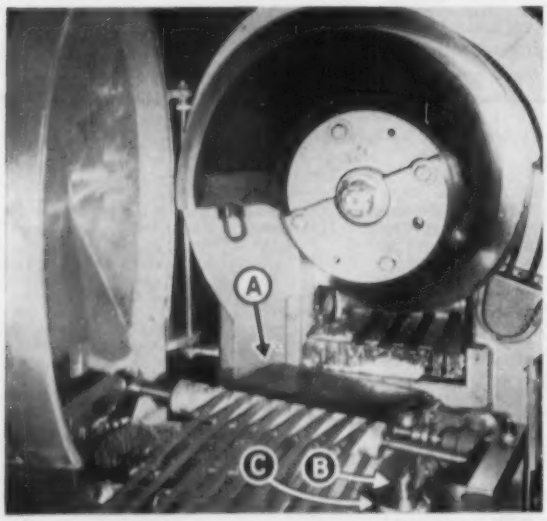
* a, b, c, etc., are different samples from same plant, such as small curd and large curd, chive, etc.



THICKNESS CONTROL for high-speed bacon slicing is given new accuracy. Vernier (arrow) that couples to hydraulic feed does the trick.



SCALE UNIT controls operation. As weight of sliced bacon reaches 1 lb., balance (A) closes electrical contact (B). This fires electronic tube that serves to halt feed. Counter-weights are hung at (C) to tare balance for different-sized packages.



HELICAL KNIFE is revealed in photo of slicer's "business end." Rod-type heater is seen behind blade. Weighing belt (A), with individual motor drive, floats on scale shaft (B). Lockout device is at (C).

Split-Second Robot Weigher

1. *Halves* Bacon "Giveaways"

2. *Crops* Slicing Crew

3. *Boosts* High-Grade Yield

FE STAFF

Dramatic proof that electronic weighing and packaging devices give big dollar benefits is seen in a statistical analysis of the new Cashin Automatic Weighing & Conveying Unit for Sliced Bacon (Cashin Inc., Rochester).

This unique production instrument handles up to 1,800 packages per hour and slashes labor costs by saving 5 women—over 40% of the crew—on the slicing line.

Further, savings are pyramided through an increase in premium yields and decreased giveaway weights, according to the report, which was made by Food Management, Inc., of Cincinnati.

Unit was developed by Tobin Packing Co., Inc., Rochester, N. Y., in cooperation with Albright-Nell Co., Chicago, for use on the latter's Anco Hydromatic Bacon Slicer.

Before going into cost figures, a look at what the device does—and how it does it—is in order.

Split-Second Operation

In operation, the "shingles" of bacon are cut by a rotating knife and fall on a moving belt. This conveyor (on 6½ in. centers) is actually part of a sensitive balance .

When net sliced-bacon weight reaches prearranged amount, balance tilts and closes a circuit. This sends an electronic impulse to a hydraulic device that stops feeding of the belly instantly. In fact, forward movement of the bacon slab is halted within ¼-revolution of the slicing knife—or .015 of a second!

Complete slicing for a 1-lb. package occurs in less than a second. Scaling accuracy keeps rejects down to a mere 5% at the check-weighing stand.

After unit of sliced product moves off the weighing belt, a second electronic component—timed to the knife revolution—instantly starts the belly forward again in such a way that no half-slices result.

This operation can be used on packages ranging from ¼ to 2 lb. And a lock-out device on the scale permits continuous slicing without separation of the shingles into unit sizes.

This lock-out is also used during cleanup periods to prevent damage to sensitive scale parts.

Weighing-belt speed can be adjusted with a simple knob control. This gives a shingle spread of from 5 to 7½ in., to fit different sized baseboards. The interval between

Savings on Labor

Old Line Workers	Old Line Element	Automatic Line Workers	Automatic Line Element
½	Press	½	Load
1	Load and grade	1	Grade and shingle
1	Shingle	1	Weigh grade-outs
1	Weigh grade-outs	1	Check weight and adjust
6	Make weight, arrange and fold	2	Fold and load wrapper
1	Load wrapper		
1	Pack in cartons	1	Pack in cartons
11½	Total workers	6½	
820 lb.	Production/hour	900 lb. (in ½-lb. pkgs.)	
1280 lb.		1692 lb. (1-lb. pkgs.)	
$3.90	Cost/cwt., incl. fringe, based on combined ½ and 1 lb. production	$ .91	
	Savings/cwt.	$2.99	
	Production (prev. year)	1,900,000 lb.	
	Total labor savings	$56,810.	

Calculated Savings on Yield: (4% increase Grade 1 only)

1,900,000 lb. @ 87% (new yield)	= 1,653,000 lb.
1,900,000 lb. @ 83% (old yield)	= 1,577,000 lb.
Increased premium yield	= 76,000 lb.
76,000 lb. @ 10¢ additional return	= $7,600.

Calculated Savings on Decreased Giveaway:

Previous giveaway per package	.42 oz.
Present giveaway per package	.20 oz.
Reduced giveaway savings	.22 oz.
2,850,000 packages per year	= 627,000 oz.
or	39,188 lb.
39,188 lb. @ 46¢ average return	= $18,026.
Total Dollar Savings for Year	**= $82,436**

ACTUAL LABOR SAVINGS, plus calculated yield and giveaway savings, are listed for Tobin's Albany operation. Today, labor savings are even higher—because some hand wrapping that was still accounted in these figures has now been eliminated.

shingles can also be varied, to increase or decrease production speed, by simply changing the firing time in the electronic system.

A specially designed roller brush, located under the weighing belt, prevents accumulation of fat that would throw off net-weight measurement.

Unlimited control of slice thickness is provided by an accurate vernier control that acts on the belly-feed mechanism. This unit, developed by Cashin, Inc., enables a reduction of waste at the tail end of the butt.

There is also an electric heating device, fitted inside the knife case, which keeps the helical blade at a constant temperature. This maintains consistent "lay" to the shingles and also eliminates ragged edges on the fat side of the slices.

Dollar-Saving Benefits

Cost calculations (see table) do not include new 14c. wage raise that went into effect in this field on August 1. Also, the figures are based on operations at the Tobin Packing Co., where a 25% fringe is used. Thus, savings will vary slightly with other packers.

Saving of personnel provides the most substantial benefit to be derived from use of this unit.

However, automatic operation gives another important gain—namely, that the carton feeder and check weigher now have more time to grade the product. At Tobin, this has resulted in a 4% increase in Grade 1 bacon.

Giveaway weight is also materially decreased with the electronic weighing device. Food Management, Inc., has estimated that average per-package giveway has been .42 oz. for all sizes.

The Tobin studies indicate that this figure is better than cut in half. To calculate savings here, the figure 46c./lb. was used as representing an average for all grades and styles (see table).

In addition, it was discovered that great uniformity is a feature of this way of packing. No package was more than .25 oz. overweight, and there were no underweight packages at all.

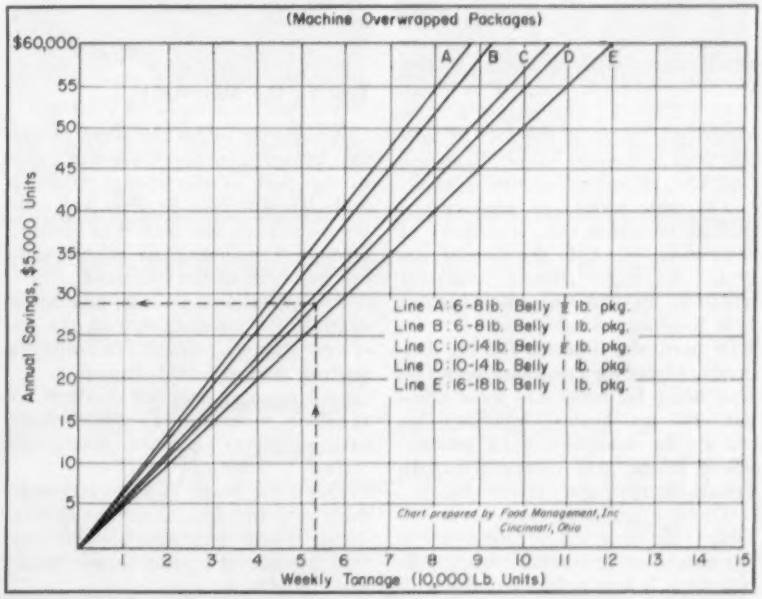
Further Accessories Coming

Present savings will be even further augmented by three more automatic accessories, soon to be released by Albright-Nell. These are: (1) A cardboard dispenser designed to eliminate all packing personnel except one grade-out girl, (2) an electronic check-weighing device developed for keeping tabs on the primary weighing unit, and (3) an automatic cardboard folder for replacing the hand labor now used at this point.

Also, Cashin, Inc., plans to make a smaller weighing belt (on 4½ in. centers) for producers who slice large quantities for ½-lb. packages. This is aimed to speed production from the present 1,800 packages per hour up to 2,600.

Gives Quick Answer On Labor Savings

This handy chart enables rapid calculation of labor savings gained by using new automatic weigh unit. Dotted-line example shows how packer who cuts 54,000 tons/week of 10-14 lb. bellies into 1-lb. packages need merely scribe a vertical line from 54 on bottom scale to line D, then run over to left-hand scale, where he finds his annual savings will be $28,500.



AT DOCK END of system, inclined conveyor carries sugar up from batch-scale building (left) to pair of conveyors running along dock-roof parallel to berthed ship. Note two drawn-up gantry cranes.

"Mechanized Quarter-Mile"

Loads 10 Tons of Bulk Sugar a Minute

Panel-controlled movers put Hawaiian product aboard ship with a whisk that slashes costs into line with mainland competition

FE STAFF

Through installation of a completely mechanized materials handling system covering a distance of more than 1,220 ft., raw sugar is now loaded into ships at the rate of fully 600 tons an hour at Lihue Plantation Co., Ltd., Nawiliwili, Kauai, Hawaii.

The new technique represents a gradual transition over a number of years—from the early shipping of raw sugar in bags (largely manually handled) to the present advanced bulk handling and shipping.

▶ **Of particular note are the big dividends. Operating costs have been cut. And being far faster and more efficient, the mechanical handling has placed the company in a position where it can stay competitive with mainland raw-sugar operations.**

The operations proceed on a veritable time-table basis. Received at the warehouse in three-bin trucks, the raw sugar is first weighed at the scale house. From each truck bin some 7 tons of sugar are side-dumped into the receiving hoppers.

Tracing the Movement

A conveyor under the hoppers and an elevator conveyor move the sugar to the peak of the storage building roof. Then it cascades from the conveyor belt to the flat floor below, forming a mountain of sugar awaiting shipment to the mainland.

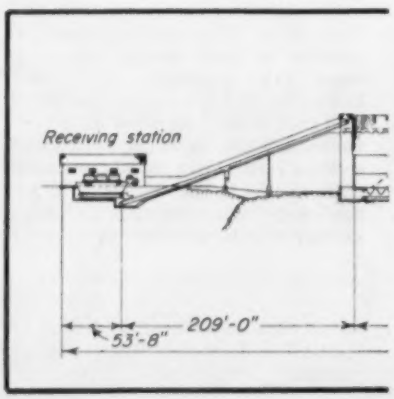
The warehouse-loading process is controlled by a scale-man at the receiving station. Sequence of conveyor starting and overload trip-off is arranged so sugar does not overflow on the floor. A number of switches along the conveyors provide emergency stops.

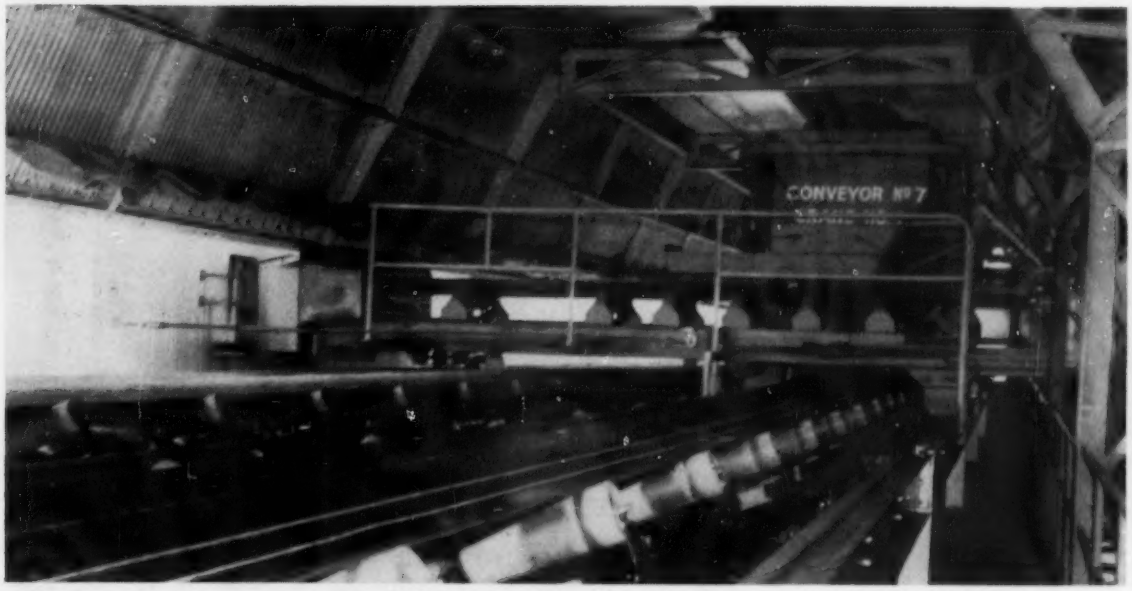
Down the center of the warehouse, flush with the floor, is a series of trap doors. These open into hoppers that feed a conveyor leading to the batch-scale building.

In detail, the ship-loading process begins as an electric shovel moves sugar from the pile that has been building up over the trap doors. Four hoppers are opened at a time to keep the conveyor fully loaded.

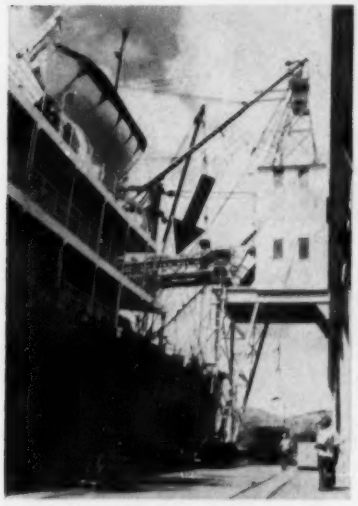
A control in the receiving hopper of the batch weighing scale regulates

(*Turn to page 224*)





TRIPPER astride one of conveyors on dock-roof. It picks sugar from belt and lifts it to shuttle conveyor leading to gantry-crane boom for delivery into ship hold. Equipment is kept spic and span.

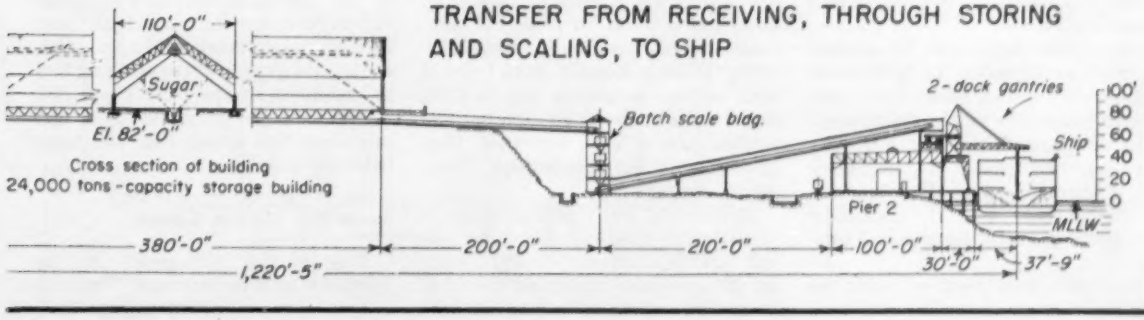


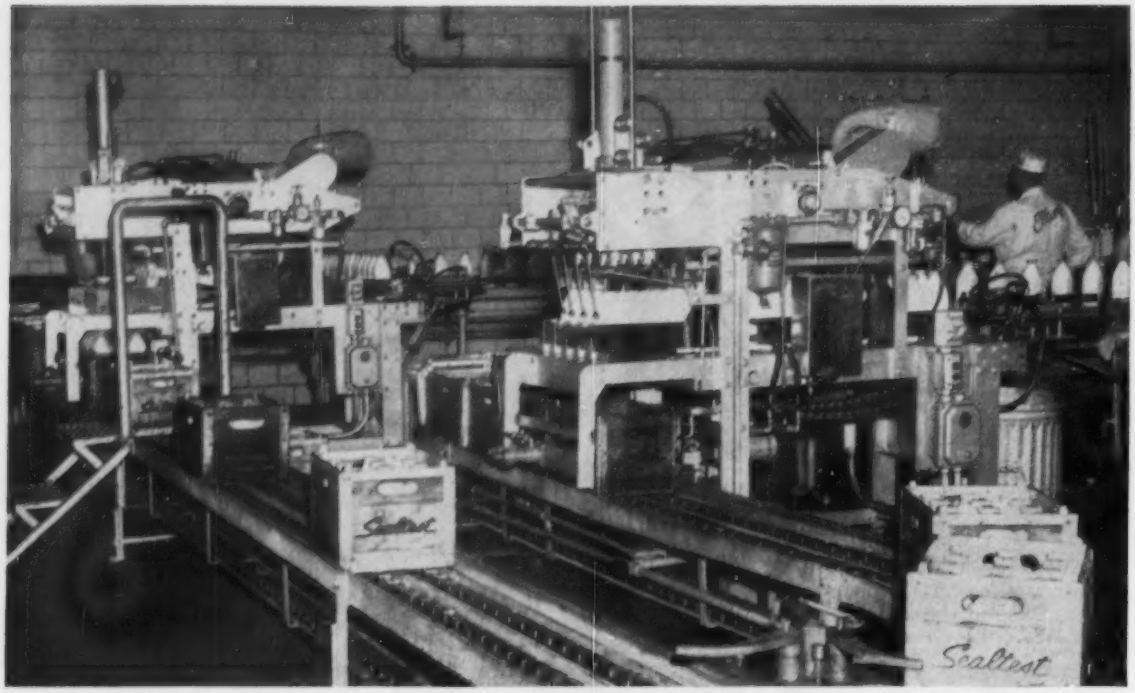
A GANTRY BOOM (arrow) is shown dropped to form conveyor bridge over ship's side for transferring the bulk sugar to hold.

TRIMMER BELT runs at high speed to throw sugar to all parts of hold. Operator directs flow in 360-deg. sweep.

PORTABLE PANEL has pushbuttons for gantry crane, conveyors, and trimmer. One button starts and stops loading.

HOW CONVEYORS ARE LINKED FOR SPEEDY SUGAR TRANSFER FROM RECEIVING, THROUGH STORING AND SCALING, TO SHIP





FILLED BOTTLES of milk are automatically assembled in dozen-lots and lowered into cases by these two packers at Detroit Creamery's new plant. Conveyor lines converge (foreground) before entering cold room.

Automatic Handlers

Up Efficiency, Make Jobs Easier

New units combined in milk bottling line give Midwest dairy top performance. Eliminate tedious, repetitive work, heavy lifting

ARTHUR V. GEMMILL
Senior Associate Editor, "Food Engineering"

Installation of automatic bottle casers, case stackers, and floor-type conveyors has greatly simplified the handling in the recently completed, 1-story milk processing plant of Detroit Creamery, Detroit.

► **And equally important, by abolishing much monotonous, repetitive work, and weighty lifting, these units have created better jobs for the employees.**

In designing this new plant, company engineers applied the latest available knowledge in an effort to make it "the last word" from the standpoint of sanitation, quality control, and automation.

Sanitation was "built-in" with the plant's structure featuring red brick floors and full-height ceramic tile walls in the processing room. It was furthered by installation of such equipment as closed storage tanks, standardizing clarifiers, and HTST pasteurizers that prevent exposure of the milk during processing.

Glass tubing is used for raw milk lines, and stainless for processed ones. Latter are equipped with special CIP fittings (Cherry-Burrell). Both types of lines enables maximum use of CIP. Result is more thorough cleaning and sanitizing, and with less work than possible with the conventional "take-down" method.

Automation was applied principally to materials handling. Here, for the first time in an American dairy, units are installed that completely eliminate manual operations from the time milk is dumped from 10-gal. cans in the receiving room until stacks of filled cases are removed from floor conveyors in the cold room or on platforms.

In addition, a sizeable portion of the milk is received in tank trucks and pumped directly to raw storage tanks in the processing room. A complete switch to this system could do away with one more manual step and, also, abolish the expensive (to purchase and to maintain) receiving equipment.

And now for a run-down on the machines that make this automatic handling possible:

Saver No. 1—The Casers

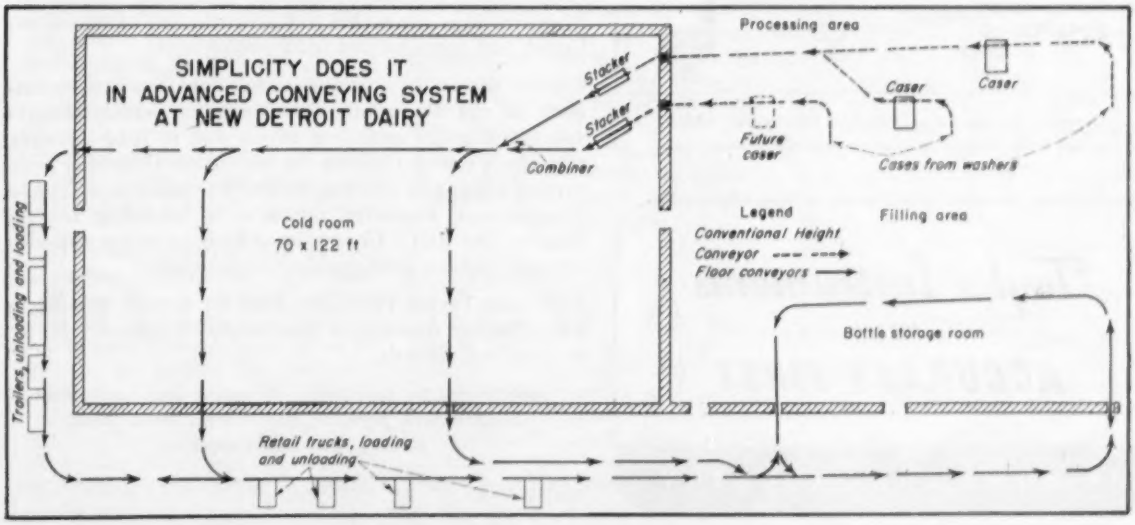
First of the labor-savers are the automatic milk bottle casers (Standard-

(*Turn to page 182*)

CASES are automatically stacked, then moved to trucks on floor conveyor. Left photo: Stacker indexes filled cases on flights (rear), forms them in stacks which are discharged to floor conveyor. Photo above: Driver moves stack from conveyor to trailer. Note diamond plates on platform floor.

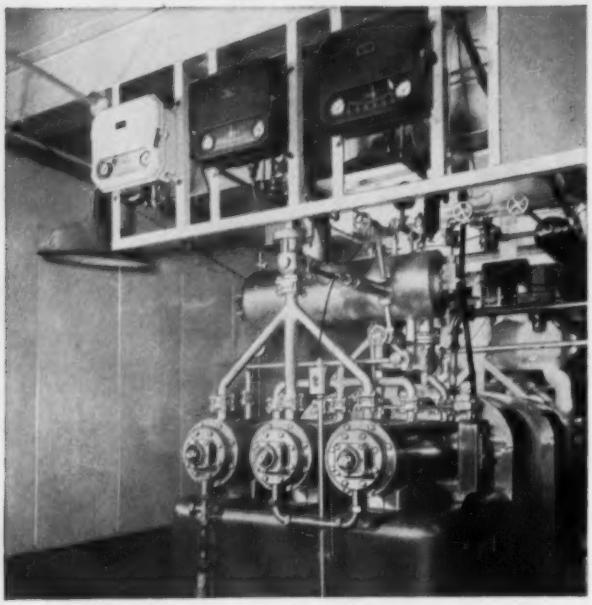
IN COLD ROOM, stacks are removed from floor conveyors, placed in special areas for retail routes.

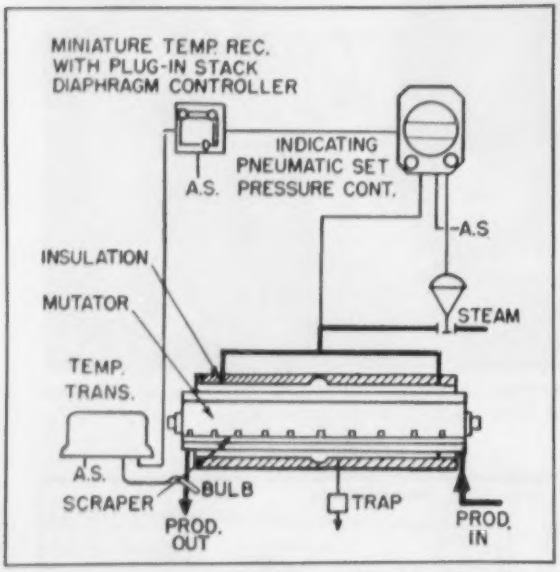
EMPTIES are transferred from retail trucks to conveyors that move stacks to bottle washers.



Taylor helps them concentrate

at PASCO PACKING COMPANY





Alternate system using TRI-ACT Controller which plugs into back of miniature recording receiver.

WITH this Taylor control system on their Slush Freeze Votator, Pasco Packing Co., Dade City, Florida, protect their fine reputation for top quality citrus concentrates. It gives them extremely close outlet temperature control and requires the very minimum of operator attention.

The TRANSAIRE* Temperature Transmitter contains SPEED-ACT* response, which compensates for the poor heat transfer from product to bulb. Transmitter output is therefore directly proportional to the product temperature change. Output from the transmitter actuates a dependable, accurate FULSCOPE* Indicating Controller. This system is applicable to the processing of all viscous liquid and concentrated food products.

System shown in drawing at left includes refinements such as the Pneumatic-Set Controller which reduces substantially the upsetting effects due to load changes, and also permits limiting the maximum allowable pressure of heating or cooling media. The miniature Transet Temperature Recorder serves as a mounting for the plug-in TRI-ACT* Controller which provides superior control without over-peaking on start-up.

Call your Taylor Field Engineer for further details, or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

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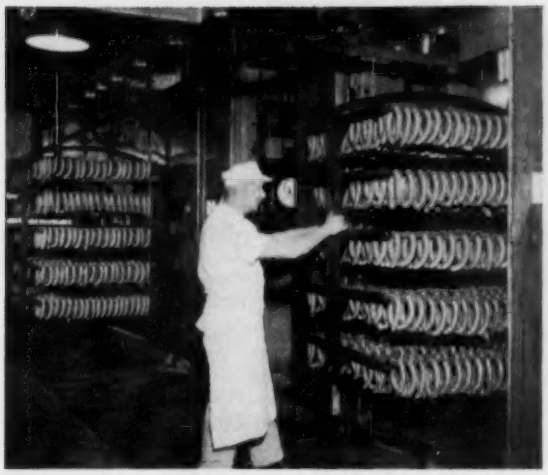


THIELE STRESSES quality-controlled products processed under sanitary conditions. Here, cage-loads of sausage products are moved into easy-to-clean stainless steel smokehouses with tile floors. Walls, too, are tiled.

UNIFORM QUALITY is further assured by company's system of blending spices for each sausage batch. This permits production department to quickly alter spice formulas in case of any deviations.

Extra Checks Clinch A-1 Quality

Milwaukee sausage maker gets top product by lavishing attention on freshness and taste appeal . . . Emphasized also are constant maintenance, good housekeeping, and well-planned processing steps

JOHN V. ZIEMBA

Associate Editor, "Food Engineering"

"At 6:30 A.M. every work day, a truckload with 20,000 or more pounds of fresh meats from a nearby packing plant backs up to our loading dock.

"About 15 min. later, after careful inspection, these meats start their swift course through our rigidly controlled production lines.

"And before another hour passes, our first batch of country-style pork sausage is rushed to the loading dock for direct refrigerated-truck shipment to local stores — with cooked and smoked items following several hours later.

"Thus we work to get all of the day's production promptly to the retailers.

"Meanwhile, we instruct our sales force not to over-stock any retailers, and to remove from display cases all sausages approaching the guarantee-period."

This expresses the sharp criteria that President W. F. Thiele, of W. F. Thiele Co., Milwaukee, has set down for putting through A-1 quality sausage products.

In truth, rapid movement of product through well-planned process lines is not the whole story. Top management's achievement of freshness and uniform quality also has been pointed up by these control practices:

1. Ingredients going into production of sausage products are carefully selected, inspected, and processed—products are virtually "led by the hand" during all stages of operation. Sausages in-process are checked several times daily.

2. Emphasis is continually placed on designing and purchasing sanitary equipment and on good housekeeping and maintenance practices.

Special Handling

Let us now look in at the beginning of the line to see the steps and facilities designed for sanitary processing of superior-quality products at this show-place sausage plant:

Speedy, unimpeded unloading and loading operations are carried out on a multi-level dock handling five trucks simultaneously. Differences in tailgate heights between company and customer trucks are compensated by a depressed dock platform with a removable lightweight, magnesium dockboard.

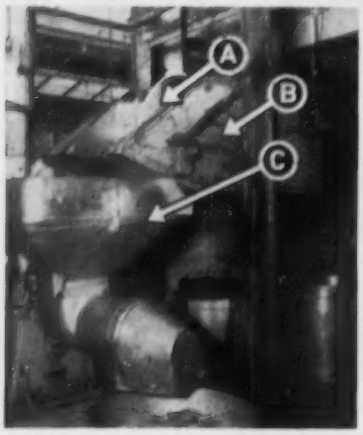
Finished sausage products are whisked from this dock to Milwaukee retail outlets by a dozen 1-ton and three 2-ton refrigerated (36-40 F.) company trucks, as well as by five 1- to 2-ton distributor trucks.

Incoming meats are received in 153 specially-designed 450-lb.-capacity aluminum drums (company-owned). These lightweight drums are used in place of wooden barrels chiefly for sanitary reasons—ease of cleaning as well as surety of absence of wood splinters or other elements likely to contaminate meats.

Further, possibilities of outside contamination during shipment to sausage plant are avoided by covering drum-packed meats with clean cloths and then sealing them with metal locking rings.

The drums serve another purpose—in-process handling of meats from boning and trimming tables to sausage-grinding machine.

Four Efficient Handling Methods



DRUM of trimmed meats (A) is secured to pneumatically operated dumper (B) for loading grinder (C).

TUB for meat has false bottom. It is dollied to stuffer, where a ½-ton hoist raises it for loading.

PNEUMATIC LIFT moves cases from packing table onto conveyor.

COMPANY-BUILT ball-transfer table eases 180-deg. transfer of toting box.

Fresh beef carcasses and pork cuts are directly monorailed into a first-floor cooler. Drum-packed meats are moved by barrel trucks from freight elevator to second-floor trimming table or hold-over cooler. Sinews and excess fat are trimmed from pork, veal, and beef.

Accent On Care

Low product temperatures are maintained until meats are cooked, or smoked and cooked, then temperatures are quickly accelerated. After heat-processing, products are rapidly chilled, with minimizing of shrinkage and accumulation of spoilage-promoting surface moisture.

Carefully inspected, trimmed fresh meats are placed in aluminum drums that are transported to the adjacent grinding machine. Here, charging of drum-loads of meat into the grinder is facilitated by a company-built hoist and dumping mechanism.

In operating this unit, a drum-load of meat is first secured in a stainless steel-lined bucket by a pair of ¼x2x6-in. stainless prongs. Bucket is then pneumatically raised and tilted to load meats into the grinder.

Ground meats then drop into another company-devised handling unit —a stainless-steel, false-bottom tub mounted on a dolly. Depending upon product to be manufactured, tub is either "dollied" directly to sausage stuffer or to chop-mixer.

Ground meats going into the silent cutter are first scaled into 100-lb-capacity aluminum tubs. Also introduced into silent cutter at this stage are seasonings, other ingredients, and made-on-the-spot snow ice.

Special Spice Blending

Seasonings are scaled for each batch in a spic-and-span basement-located spice room. Spice blending is carried out to enable the company to maintain closer, more uniform control over product quality. Too, the company feels it is thus a simple matter to make quick formula adjustments.

Working from production schedules an experienced girl prepares, 2-3 days in advance, spice blends for each batch to be made up in the silent cutter. Spice blends are scaled from bins or drums into bags, which are stacked on shelves.

Prepared, for example, are spice blends sufficient for 500-lb. batches of skinless frankfurters or 300-lb. of large bolognas. When needed for a day's production run, bags of blends are loaded onto a rack-type truck for elevator movement to the second-floor silent cutter.

Additional Measures

Freshness is also assured through preparation and inspection of such other ingredients as cheese, pickles, olives, and onions on a special table near the chopper-mixer.

As a further ingredient-preparation safeguard, a dicer (Diana) is employed to check product-temperature rise. Dicer abolishes the need of scalding meats to soften them.

Unit comprises a pair of rectangular molds, each holding 12-15 lb. of meat. Mounted on a rotary disk, molds are alternately carried under a hydraulically operated plunger, which forces the meat through two sets of knives that cut it into long strips. A circular knife then dices the strips.

Product is discharged from silent cutter into portable, stainless steel meat trucks, and goes into an adjacent chill room. From here, meat is moved to the next room, which is equipped with three 500-lb.-capacity stuffers.

Loading of stuffers is carried out in two ways: (1) Raising false-bottomed tubs by a monorail-mounted, pneumatically operated ½-ton hoist; and (2) shoveling meats directly from meat trucks.

Stainless steel stuffing tables are engineered for flexibility and handle any type sausage product. And portable linking machines further assure flexibility.

Straight-Through Flow

Linked items are hung on sticks or aluminum rods placed on rail trees. Loaf and similar goods go on monorail-mounted racks with four shelves.

Non-cured items like country-style sausages are separated from the cured to prevent discoloration during handling. And for this reason, they are directly 'railed from second-floor stuffing room to first-floor pork cooler (36 F.) for packaging. In this room,

POWELL VALVES ... THE COMPLETE QUALITY LINE ... POWELL VALVES

FIG. 150—Bronze "Union" Vulcanized Composition Disc Globe Valve For 150 Pounds W.S.P.

FIG. 375—Bronze Gate Valve For 200 Pounds W.S.P.

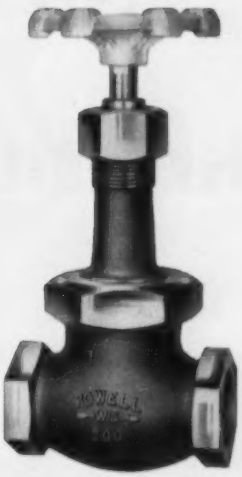


FIG. 2608—Bronze Full Flow Globe Valve For 200 Pounds W.P.

FIG. 560—Bronze Regrindable Horizontal Swing Check Valve For 200 Pounds W.S.P.

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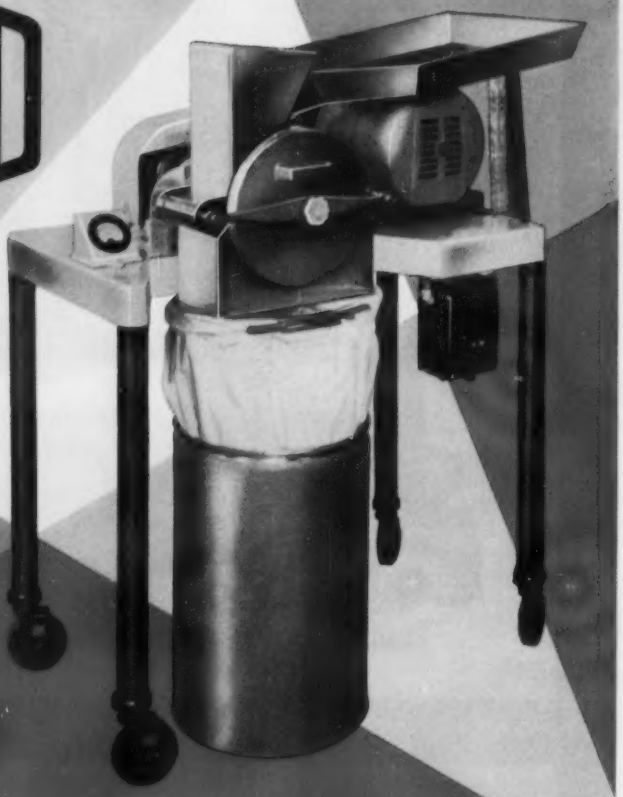

A New Multi-Grind Pulverizer Designed to Insure Product Purity

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The new MIKRO-Multi-D Pulverizer has been especially designed for any processing system in which purity of the product is of prime importance.

This new unit, which provides precise particle control in the 4 to 20 mesh range, is light, yet durable. It is easily assembled and disassembled, permitting quick changes from one product to another with complete freedom from spoilage or contamination. It can also be readily adjusted for speedy changes in particle sizing.

Its ease of thorough cleaning and reassembly makes the MIKRO-Multi-D ideal as a utility unit for many industries, but particularly in the food and drug fields. A test on your own product in the MIKRO Laboratory may provide a solution to your grinding problems.

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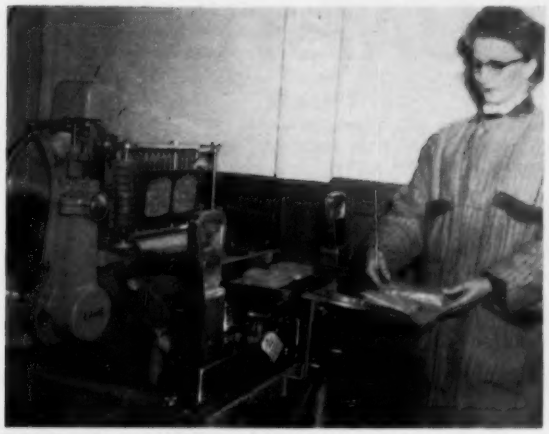
Two Efficient Packaging Lines



PACKAGING SLICED MEATS: Unit (left photo) slices meats into two 7-oz. stacks that are automatically weighed by built-in scales, then inserted into pouches. Right photo: Dual-heat machine vac seals pouches.

the beef is also boned and trimmed.

Meats to be smoked or cooked are monorailed from stuffing room, through a stainless steel door, to the smokehouse alley. In present stages of modernizing, two of the five 2-story smokehouses have been replaced with single-story 6-and 8-tree capacity Julian units.

Plant Superintendent William Griffiths states that heating of temperature-controlled smokehouses is accomplished by steam coils and gas-fired burners. Temperatures are first brought up to 120 F. with steam coils and, from that point, are rapidly raised with gas burners.

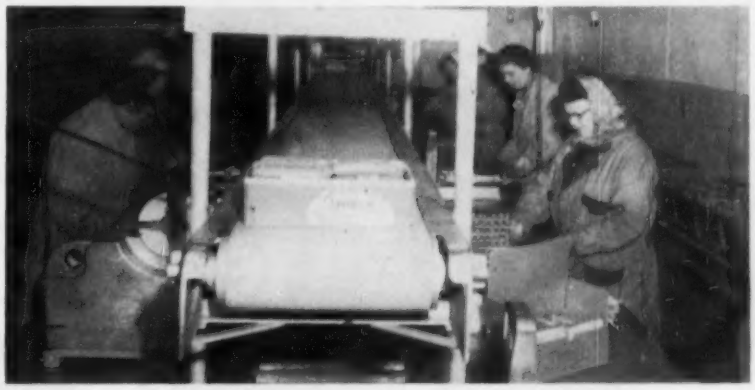
Interesting, too, is the adoption of the single-story smokehouses as ovens for baking loaf goods.

Four 1,000-lb. capacity vats were designed for water-cooking certain items. Sanitary features were stressed in the fabrication of these trough-shaped cookers, for they are made from heavy-gage stainless steel with rounded easy-to-clean bottoms. Cooking heat is furnished by a thermostatically controlled perforated steam pipe on the bottom of each vat.

Lipped, counterweighted, stainless-steel lids cover the cooking vats to minimize escape of steam and any subsequent undesirable condensation that could peel ceiling paint.

Products needing additional cooking, like wieners, are 'railed into four cookers (Jordan). Rinsing then follows in a 9-tree-capacity tiled area that is equipped with spray nozzle-type overhead water pipes.

At this point, flow of products is in two directions—(1) over scales and through coolers to the second-floor self-service packaging department, and (2) to the first-floor slicing-wrapping room. Water-cooked loaf goods, however, go to a second-floor cooler.



ON THIS 2-in-1 line skinless wieners are weighed and heat-seal-wrapped in ½- and 1-lb. units (right). Packaged on other side of line (left) are sheep-casing franks and other sausage items.

Now we'll follow through on self-service packaging operations:

Tree-hung items go to a 7x25-ft. preliminary chill room, where they are quickly cooled by overhead, ammonia-refrigerated, fin-type coils to check shrinkage and to retain product bloom. Trees of skinless franks, on the other hand, by-pass this second-floor chill room as they are transported for overnight cooling into a 45-deg.-F. peeling room, where artificial casings are machine-stripped from the wieners.

Peeled, skinless frankfurters are loaded into 35-lb.-capacity plastic tote pans that are sturdy and light in weight. From a skate-type conveyor, these pans make a 180-deg. turn on a company-made ball-transfer table to a roller conveyor. The pans of peeled wieners are then manually transferred onto one side of the self-service packaging line, where they are put up into cellophane-wrapped ½- and 1-lb. packages.

Tree-'railed out of the cooler and packaged on the other side of the line are such items as sheep-casing frankfurters, braunschweiger, liver sausage, smoked sausage, and Polish sausage.

Adjacent to this line is another—for wrapping (Cry-O-Vac) smoked butts, ring bolognas, etc. These items are then packed into shipping cartons.

To facilitate raising these cases 14 in. from packing table to a skate-type conveyor, the company constructed a simple air lift operated by foot-pedal. Built into the packing table, this unit comprises a galvanized metal shield (8x14x14 in.) with four aluminum strips (¼x1¼ in.) screwed on top to secure it. Shield is attached to a vertical, cylindrical shaft that operates under pressures up to 75 psi.

All cased goods from this packaging line are conveyed to a girl who inspects packages, check-weighs, and then string-ties them. Cases then

(Turn to page 156)

BRINE HEADQUARTERS

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with all brine-using industries . . . enable International
to provide the equipment, methods and know-how
to make better brine at lower cost with greater efficiency
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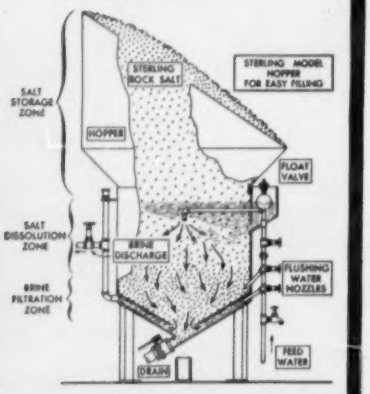
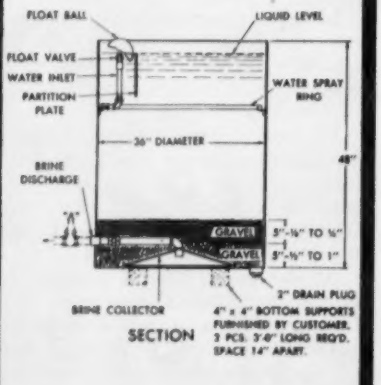
THE STERLING MODEL
LIXATE
ROCK SALT
DISSOLVER



THE STERLING
EVAPORATED SALT
DISSOLVER



SECTION

Zips Feathers From 7500 Birds Per Hour

Super-fast picker frees 10 workers. Replaces 4 or 5 older units. Saves space. Simplifies process. Reduces plant power costs

ROBERT BERNICK

"Food Engineering" Special Correspondent, Salt Lake City, Utah

In stepwise advances, poultry technology and engineering have made considerable improvement in defeathering.

The relatively new technique of sub-scalding (FE, Jan. '55, p. 96) has significantly reduced manual picking costs and improved the performance of mechanical pickers.

Now comes a big mechanical advance—the Spiral Picker. Both sub-scalding and the new machine are paying off at Utah Farmers and Poultry Coop., Salt Lake City. And the picker is chalking up these advantages:

- **Requires only two operators for finish pinning, a labor saving of 10 or 12 operators on this line.**
- **Eliminates four or five conventional picking machines.**
- **Does a 99% complete job on 7,500 chickens or 5,000 heavy tom turkeys an hour.**

Through replacement of a series of units, the process line is simplified by this machine.

Made by Barker Poultry Equipment Co., Ottumwa, Iowa, and Modesto, Calif., the unit comprises a stainless steel chute which spirals upward around a 66-in. dia. revolving drum.

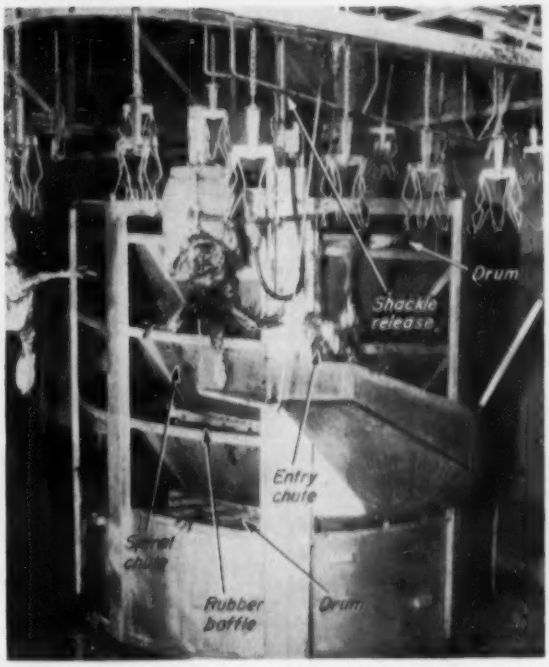
Set into the drum are 3,800 rubber picking fingers, these corrugated, flexible fingers being 3 in. long. A 20-hp., 220/440v., 60-cycle motor drives this drum at 100 rpm., producing a linear picking-finger movement of about 2,000 fpm.

In 18 months, there has been no need for finger replacement on this drum. This is in contrast to daily finger inspection and replacement on conventional picking machines.

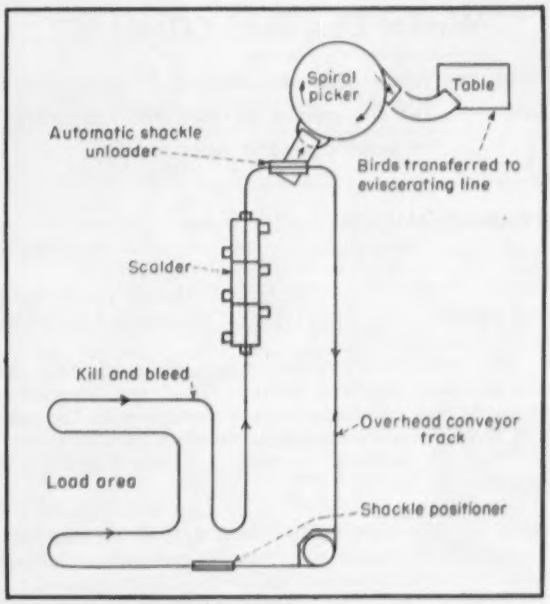
The continuous, spiral chute is one-sided, being open next to the drum. It has 100 rubber baffles attached to its side, and these turn the birds on their longitudinal axes, as they are moved up the spiral—to assure complete picking. Friction of the picking fingers moves birds up the chute to its exit.

Pressure sprays wash the feathers to the bottom of the picker. There they are swept to an exit and a conveyor by lengths of rubber belting attached to the bottom of the spinning drum.

The unit is 10 ft. in diameter, 11 ft. high, and weighs 8,670 lb. Shipped knocked-down in crates, the machine is easy to assemble.



AUTOMATICALLY unloaded from shackles, turkeys drop into loading chute leading to spiral chute. Revolving, finger-equipped drum picks birds and conveys them up spiral. Rubber baffles turn birds to assure complete feather removal. Exit is on far side of unit.



SIMPLE PROCESS line is achieved by substitution of single, high-capacity defeathering unit for series of conventional picking machines.

When the new picker replaced the old machines, the poultry monorail system was redesigned and automatic shackles installed.

And here's how the new line operates:

Birds are clipped to shackles by their feet. They pass through the killing and bleeding area and into a 138-140 deg. F. sub-scalder. They then move on the monorail to the shackle unloader, where (Turn to page 224)

"It was a perplexing point: Were the men laid off on a vacation? Or were they vacationing on a layoff?"

Ole Sage Episode

WHEN CLAUSES CONFLICT

—in the union contract, there's a tough row to hoe . . . But Ole comes up with the "instances" for getting on the right footing

IVAN C. MILLER
Associate Editor, "Food Engineering"

The Guff & Gripe Luncheon Club was already in its full informal swing when Ole Sage came in and headed for his accustomed chair.

And it was quickly evident to him, as he sat down, that the perennial argument between "line" and "staff" men again was on. Though not yet through with the main course, the boys already had drawn sharp lines.

Si Worth, personnel manager at Zenith Canning Co., was holding forth:

"It's easy for you fellows in production to criticize staff men who negotiate union contracts. But no reasonable person should expect every possible grievance or dispute in a shop to be anticipated and covered in an agreement.

"Besides," he added where are you *fellows* when we ask for advice before new contract talks?"

At this, Batt Bulwark, works manager at Mull & Mull Co., spoke up:

"It's not a question of anticipating everything. We've got grievance procedure and arbitration to take care of the small, unforeseen stuff that comes up.

"But," he went on, "it beats me the way you fellows sometimes neglect to spell out exactly what you mean on important matters. There's nothing worse than having to make a decision affecting the whole shop and involving a lot of money when there's no clear contract guidance."

Replies then came thick and fast from the line men. And the vociferating continued back and forth until after coffee, when Si turned to Ole.

"You've been unusually quiet," he said. "But now let's have the picture as you see it from your long experience as worker, foreman, industrial relations man, and now consultant. Such a background surely must qualify you for an impartial opinion—at least impartial between line and staff men."

Weighing the Worst

Ole shifted his big frame. "Well," he opened up, "I've been thinking about that remark of Batt's to the effect that nothing's worse than a situation not covered by the contract. And that, I admit, can be mighty awkward.

"But I'd say that No. 1 here is the recognition that there *is* something worse—I mean things like one situation covered by *two* separate clauses of a contract.

"And this does happen—as I well remember a few years back when I was with a food specialty plant out West.

(*Turn page*)

Meet Ole Sage . . .

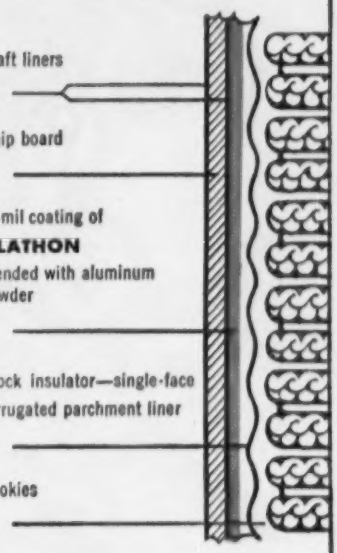
Up the hard way come Ole, our principal character in this special series of "cases" fictionized to pinpoint boss-worker problems in the 1955 food plant.

Ole began as a laborer, proved himself "a good worker" who "used his head" —thus won the respect of both workers and bosses. He later rose to foreman, then superintendent. And finally he was management's choice as "a natural" to head Industrial Relations, a job he carried out with unusual success until his retirement.

—Actually, his was a very short retirement. Because his old company, and others, too, quickly were calling on him for counsel—as related in these episodes.—*The Editors*

See how "Alathon" protects chip board—gives better display to bulk cookies!

CROSS SECTION OF COOKIE CADDY



Paperboard coated by J. D. Cahill Co.

"Alathon" blended with aluminum powder by L. A. Dreyfus Co.

Carton designed and produced by Robert Gair Company

Merchandising bulk cookies in retail stores presented a tough packaging problem for the Federal Sweets and Biscuit Company.

The high shortening content of the cookies stained corrugated caddies, so glassine innerliners were used. In addition, a printed overwrap was required for eye appeal.

After considerable testing, the Robert Gair Company of New York designed and produced the more efficient, more economical merchandiser shown above. The secret: a coating of pre-blended "Alathon" polyethylene resin and aluminum powder on the inside of the carton.

By applying a ¾-mil coating of the "Alathon" and aluminum powder blend to the back liner of .040" Kraft-lined chip board, a strong folding carton was developed with a foil-like finish on the interior. This produces a clean, sanitary appearance . . . and long shelf life results because of the non-staining and non-sticking properties of "Alathon." This new board also permits a much better job of printing than the corrugated board and results in a more attractive package without the use of an overwrap.

Unmodified coatings of "Alathon" also offer: strength; transparency; moisture resistance; heat sealability; low-temperature flexibility; chemical resistance; freedom from odor, taste and toxicity.

NEW 36-PAGE BOOKLET

"ALATHON® Polyethylene Resin as a Coating Resin for Flexible Materials" is yours free! Just send the coupon below.

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Which type of package are you interested in?

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- ☐ Single-ply bags
- ☐ Pouch bags
- ☐ Board cartons
- ☐ Board trays
- ☐ Fiber drums
- ☐ Corrugated boxes
- ☐ Fiberboard containers

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Zest holds fresh, tasty goodness in new, popular mealtime treats . . . never lets a flavor fade!

Delightful, deep-sea fresh fish sticks . . . naturally tasty, convenient frozen dinners . . . these are fast moving, profitable items high on grocery lists today. Competition is keen in these new fields, and you need wholesome, naturally fresh flavor to build lasting brand loyalty. Staley's Zest MSG is famous for building better flavor in frozen foods. Zest *never lets a flavor fade* . . . protects freshness and taste from damage during processing, brings out flavor perfection all the way to the dinner table, prevents "steam table fatigue." Zest is easy to use, too . . . you just add it like salt. Start boosting profits now with Staley's MSG. See your Staley representative or write today for more information.

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OTHER QUALITY PRODUCTS
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"This outfit was small—only about 125 employees. And it was none too solid financially. Anyhow, we ran smack up against a problem that really gave the big brass some mighty anxious weeks.

"It all started after a shutdown during the summer. You see, things had been slow, so management had closed the plant for a week of vacation. Anyway, the men came back on a Monday—I think it was July 17—and they hadn't worked for more than a day when cancellation of some orders forced a layoff.

"At this, the union demanded a full week's pay for all the employees, basing their claim on a contract clause which read: 'Any employee being recalled after a layoff shall be assured at least one straight week of employment at the regular workweek schedule.'

"Well, that hit management like a ton of bricks. A week's pay for 125 workers would have cost something up to $5,000—hard going for that small company, which wasn't far from the financial rocks to begin with.

"Company management was really sweating blood and nearly threw in the sponge. But then it came up with a very happy point for disputing the union's claim. Denying the men had been "recalled after a layoff, and declaring they'd been on vacation, it specifically noted the contract clause that said 'the vacation period shall be between June 1 and September 15, and the company may elect to close the plant for a specified period if it so desires.'

"So," continued Ole, "we had a case where not one but two sections of the contract applied—posing the perplexing point of whether the men were laid off on a vacation, or whether they were vacationing on a layoff. And since neither the union or management would back down, the matter went to arbitration.

"In this weighing of the case, there was specific examination of the two clauses in question, followed by checking of the rest of the contract and also the employer-employee relationship. Then this is what the arbitrator found:

"When the plant closed for what the company termed a 'vacation,' there was no mention or even hint of any employment separation, discharge, or layoff. Nor, on the other side, were there any instances of workers quitting.

"Also, no names were stricken from the records and placed on reserve, doubtful, or recall lists. And no insurance benefits were cancelled—in fact, it was proved that certain employees utilized their hospitalization benefits during the period.

"Further, no evidence was produced to indicate that employees had even contemplated filing for unemployment compensation. And no question of seniority, as always prevails during a layoff, was raised.

"For all these reasons, the arbitrator held that the men had not been on layoff, in the terms of the contract, and that following their return on July 17, there was no obligation by management to provide a full week of work."

Ole paused, then turned to Batt and said: "I guess you'll agree then, that failure of a contract to mention a subject isn't the only source of difficulty that must be eagle-eyed."

"Yes, you've sold me," said Batt. Then seeing a chance for a friendly dig at Si he continued: "Apparently these staff guys have more than one way of fouling up a contract."

Not So Foolish

"But seriously," he went on, "that story makes something else clearer. *Now I can understand how important it is to prepare an arbitration case with as much care as contract negotiations.*

"If that company hadn't brought in all those facts about Blue Cross, unemployment compensation, seniority lists, and the rest, the decision might have gone the other way.

"So I guess next time the front office people come around asking me for a lot of what seems, sometimes, like foolish information, I'll really go to the mat for them to help out on the arbitration aspects."

Editor's Note: The settlement quoted in this fictional episode is taken from an actual parallel case that was weighed under rules of American Arbitration Assn.

Particularly, readers should not infer that other arbitrators would reach the same decision in apparently similar cases, since circumstances differ widely, thus altering the factors.

Rather than being based on precedent, decisions derive from case histories, points of specific contracts, and pertinent evidence.

From Ole's Notebook

OBSERVATIONS

Re "Shadow" Foremen

The title "foreman" is not always applied to the same level of authority in all industries. And often it may cover varying degrees of responsibility and authority in different plants of the same industry.

Of the approximately 700,000 in American industry so titled, considerably more than half are "shadow instead of substance"—that is, they are not management *in fact*, though they are considered to be management *legally*.

Surely, after foremen have turned to a union for security and protection they will not think as management or with management.

So, too, there are many "foremen" who not only don't belong to a union but who don't fit into the management group, either. A few of these situations are the result of faulty selection in the upgrading program.

However, most of these men are in a "no-man's land" due to top management action. In short, they are "foremen" who are (1) paid wages, (2) not given real authority, and (3) intentionally kept "uninformed" by a management that's interested only in executives at the top.

"On Job" Savings

Management no doubt thinks of its "absenteeism-pain-in-the-neck more in terms of the "voluntary" type—employees staying away for the ballgame, fishing, or on account of the preceding "big night."

It remains, however, that in some organizations absences from the "unavoidable causes" classed as accidents and illnesses are much more costly than those labeled "voluntary."

In the food industry alone estimates of the costs of absences expressed in terms of total payroll range from 1.5 to 4.0%, or between $75,000,000 and $200,000,000.

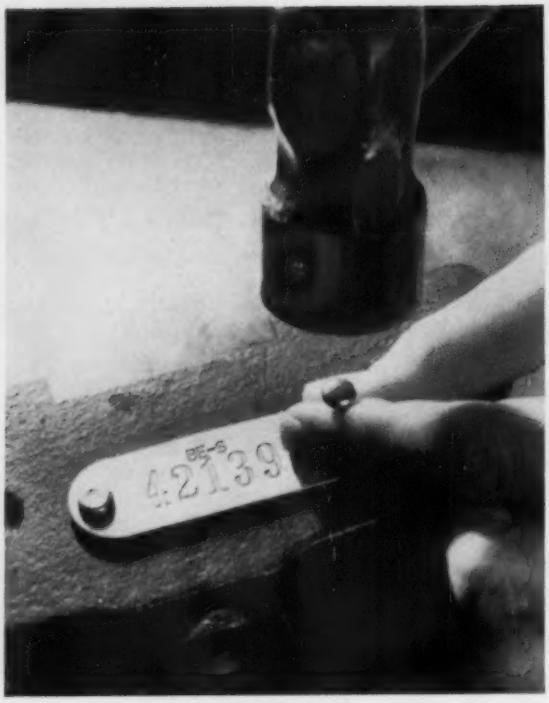
There is ample proof that both vol-

(Turn to page 115)

How to Get *Positive* Equipment Control

Maintenance planning is made easier with this double-duty tag-and-card plan that gives engineers and accountants alike a compact case history of each plant machine

ROBERT J. KELSEY
Assistant Editor, "Food Engineering"



Sure Identification . . .
. . . is achieved by this permanent tagging that cuts lost, stolen, and strayed machinery to a minimum. No-fuss procedure involves drilling two tiny holes—then hammering home spiral-grooved rivets.

Prime need in any maintenance program—big or small—is an efficient equipment control system whereby purchases, movements, and machinery disposals can be accounted for on an up-to-the-minute basis.

Just such a method has been developed by General Foods Corp. for use in its far-flung Birds Eye Div. Here, multi-plant operations call for constant planning and frequent equipment shifts to meet seasonal processing demands.

To keep track of approximately 2,800 movements in new and old machinery every year, this company puts consecutively numbered metal tags on each piece of plant equipment. These are keyed to compact equipment cards that not only provide the engineering department with vital information on available machinery types, sizes, locations, and uses—but also contain space for all pertinent accounting figures.

Thus, each card represents a full case history of the specific piece of equipment it represents.

Tag-&-Card Method in Action

Let's follow a piece of machinery as it enters a plant to see how truly simple the program is:

Upon receipt of a new item, the plant shipping clerk immediately rivets a numbered metal tag to the equipment (see photo). In the case of machinery with several major component parts, he tags each separate piece.

These plate numbers are then entered on the clerk's receiving report. Following this, two equipment cards are filled out. One of these is retained in the plant's file, the other, along with the receiving report, is forwarded to central office fixed assets department.

Card data includes a complete description of the machine, together with tag number, plant location, manufacturer, type of equipment, and serial number. Purchase year is entered and is followed by a key number that indicates the broad use for which machine was bought. On front of form (see illustration), the figure 7 is used to indicate "General Frozen Food Machinery" category under which refrigeration compressors are classified.

Since all Birds Eye construction is done under work orders, a job number is also included on the card for cross-reference by the accounting department.

A record of transfers is kept on the front of the card. Procedure in this circumstance calls for the shipping plant to send its copy of the equipment card to the main office with a completed transfer form. Card is forwarded to the new plant after location correction has been made on office copy.

If equipment is to be put to a new use, this fact is also recorded on the card. No transfers are made unless tag number and card are in order.

In addition to aiding the main office engineering department, the equipment card does double duty by keeping a record of depreciation figures and installation and shipping costs for the accounting section.

Accounting Practices

For this work, the account number (upper right hand on card front) is all important. The first four figures used (3101) indicate that this compressor is used by the Birds Eye Div. The last two numbers (63) show that the item is a piece of freezer equipment.

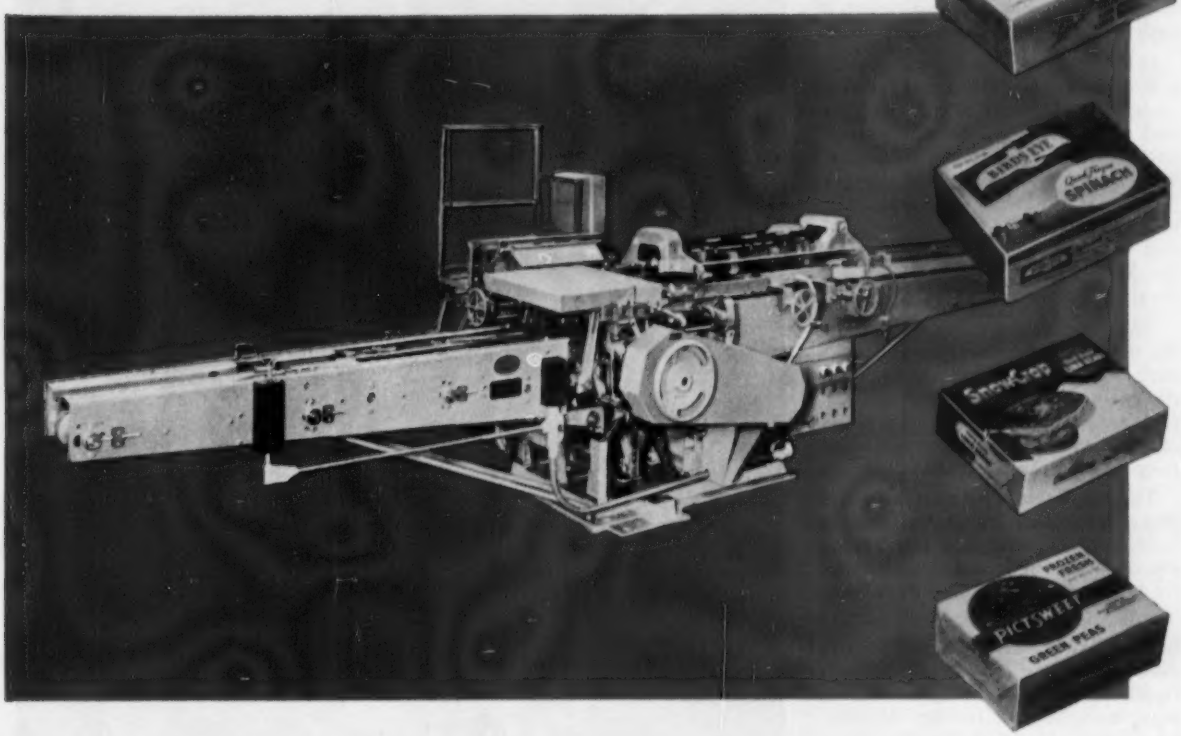
Other categories have been set up to cover machine applications for all specific operations and products.

Cards are filed in tag order under the account numbers. Each plant in the division has its own separate file.

Depreciation figures for each item are entered on IBM cards, which can be quickly machine-selected and cast up for evaluation of total yearly depreciation in each category.

To keep this record true, individual plants also fill out

CUT YOUR WRAPPING COSTS WITH 160-A-MINUTE SPEED



If you really want lower costs, put the Model FF-H wrapper on your production. You'll get neat, trim, smart-looking packages that help win sales. Finest electric-eye mechanism and slip-proof paper feed provide registration accuracy, even at 160-a-minute speed.

Your cartons take a fast, straight-line horizontal trip into the FF-H on the integral automatic feeder. Paper feed stops automatically when no package is fed. The counterbalanced "lift-up" transport assembly minimizes down-time for cleaning and adjustment.

Model FF-H is a revelation in smooth operation. Loads are so evenly distributed throughout the wrapping cycle, bearings and moving parts are shock-free. It is a one-operator machine, engineered to assure far-ahead performance and economical maintenance. Save money in *your* production with today's most advanced high-speed frozen food wrapper. Write for complete facts about Model FF-H.

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NEW YORK • PHILADELPHIA • BOSTON • CLEVELAND • CHICAGO
ATLANTA • DALLAS • DENVER • LOS ANGELES • MINNEAPOLIS
SAN FRANCISCO • SEATTLE • TORONTO

For more information, use coupon on last page.

New counter-current extractor gets more flavor out of coffee

. . . with help of TIMKEN® bearings

HERE'S a new wrinkle in the making of soluble coffee: The Vulcan-Kennedy Solvent Extractor, manufactured by the Vulcan Copper & Supply Company, Cincinnati, Ohio.

In this machine, the ground roasted coffee enters the extract near the extract discharge end of the machine, and the coffee solids are carried counter-current to the liquid flow. The weaker the coffee grounds get, the hotter the water becomes. Hot water is introduced at the opposite end where the extracted grounds are discharged. This process gets the maximum flavor out of the grounds.

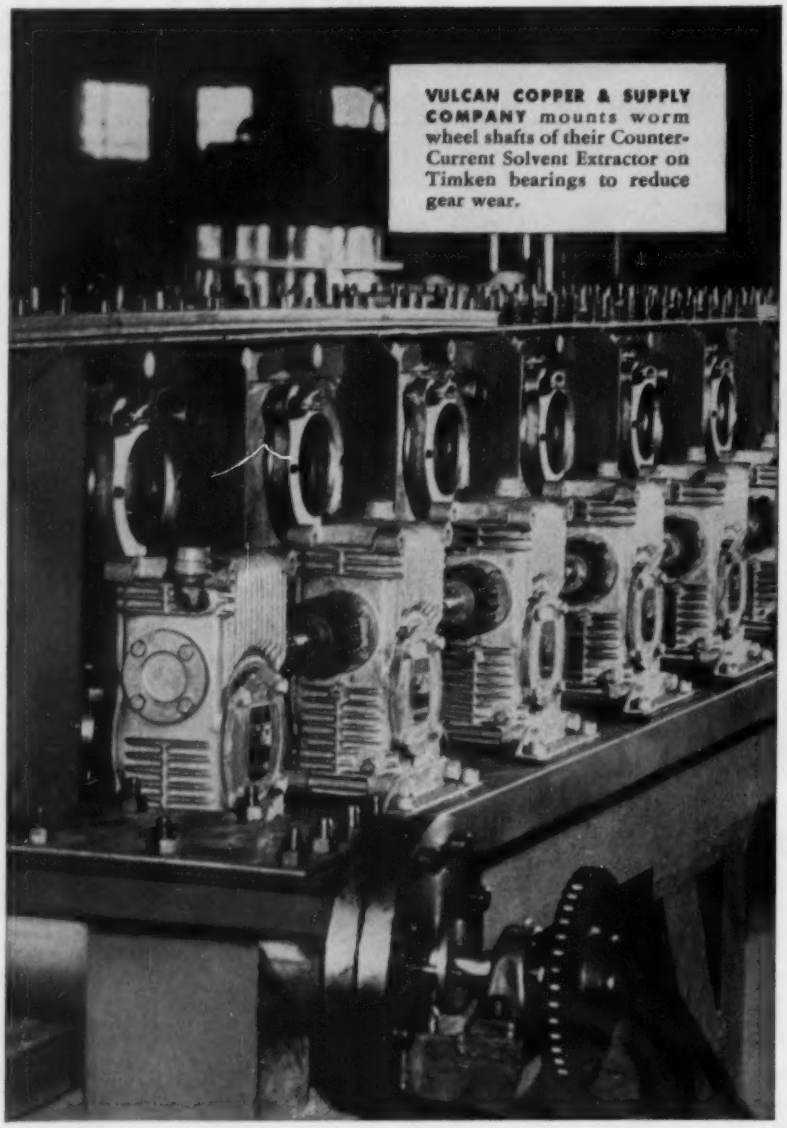
The grounds are powered through the water by 18 worm gear reducers, each with 2 Timken® bearings on the worm wheel shaft. Timken bearings hold the wheel in accurate alignment to prevent excessive wear and friction between the gears.

The heavy thrust load on the worm wheel is handled without extra thrust bearings. Timken bearings, being *tapered,* take both radial and thrust loads, or any combination of the two.

Timken bearings keep shafts and housings concentric, making closures more effective. This is particularly important in any food-processing equipment because leakage of lubricant from around the worm wheel shaft must be prevented.

Specify Timken tapered roller bearings on the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



VULCAN COPPER & SUPPLY COMPANY mounts worm wheel shafts of their Counter-Current Solvent Extractor on Timken bearings to reduce gear wear.

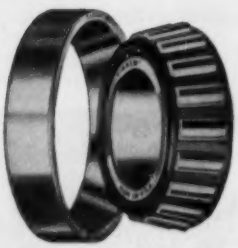
OUR OWN NICKEL-RICH ALLOY STEEL MAKES TIMKEN BEARINGS TOUGHER

Nickel makes steel tougher. And we don't skimp on nickel in the fine alloy steel we make for Timken bearings. Our steel-making specialists use the exact amount to give Timken bearings the toughness they need to withstand shock, last longer. We control the quality of Timken bearings at every step in production—from melt shop through final bearing inspection.

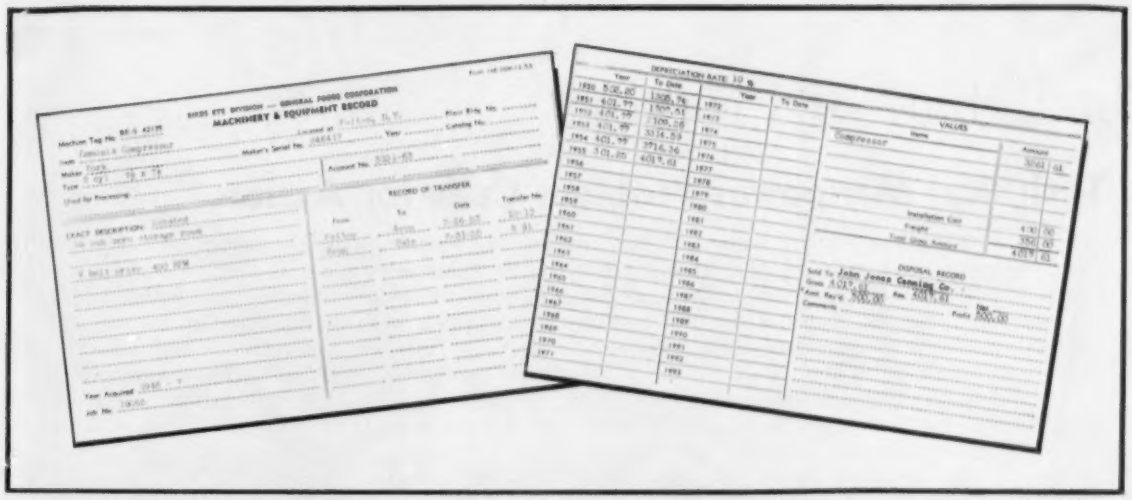
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◐ AND THRUST ◐ LOADS OR ANY COMBINATION ✳



ENGINEERING DATA is contained on front side of card, along with location and transfer record.

ACCOUNTING DEPARTMENT uses space on reverse side for pertinent cost and depreciation figures.

cards—though no tags are issued—whenever rearrangement of production lines or new construction involves capital expenditure.

Other items which have cards but no tags are buildings, machine foundations, platforms, paving, piping, wiring, valves, and flumes. Minor components—such as pulleys, shafts, small starters, and motors less than ¼ hp.—are also exempt from the tags. However, some of these may be included in the tagging and description of a major unit.

Sale or junking of machinery is carried out by the individual plant after approval by main engineer's office. When this occurs, appropriate section of the plant card is filled out, and form is sent in to main office for final processing.

Tag numbers are never repeated in Birds Eye's system. Thus, if one becomes detached and lost from its machine, a new number is issued and the change is reported.

Ole's Notebook

—*Continued from page 111*

untary and involuntary absenteeism can be reduced. And even that lesser estimate of $75,000,000 represents a good deal of money justifying—and certainly inviting—extra endeavors to cut it down into solid savings by "keeping them on the job."

Top Echelon Boosts Safety

In those company anti-accident plans where the safety engineer reports directly to a member of top management, frequency rate of mishaps and severity of lost-time injuries are considerably lower.

This has been borne out in a survey conducted by the American Society of Safety Engineers among its members.

Frequency rates between 4.5 and 5.9 and severity rates between 0.24 and 0.39 are found in companies where the safety engineer reports to the company president, vice-president, general manager, or works manager.

However, in firms where he reports to the production manager, factory superintendent, industrial relations director, or plant engineer, the frequency rates range from 8.6 to 11.0 and severity rates from 0.86 to 1.14.

These figures reflect the importance placed by management in the safety engineering program, and also the administrative and technical abilities of the safety engineer.

Further, lower frequency and severity rates are found in those companies where the safety engineer had the greater experience.

In the stronger safety programs where the safety engineer makes his own safety policy decisions, both frequency and severity injury rates are generally lower (averaging 4.8 and 0.46, respectively) than in programs where safety policy is administered by a group (9.5 and 0.98).

CLIPPINGS & COMMENTS

Industry Press Relations —As Editors See Them

There's definite room for improvement in industry press relations, according to a survey by the Opinion Research Corp. among newspaper editors in twelve large cities.

■ **This check finds that the No. 1 problem is the tendency in management groups to try to keep news to themselves.**

In detail, editors of 43 major dailies reported their problems with local firms were: (1) Withholding of news, 60%; (2) "Companies don't know what news is," 26%; and (3) "Companies don't know our paper's needs," 19%.

Asked what companies can do to improve their press relations, the editors offered these suggestions: (1) Supply information (79%); (2) Be frank, honest, factual (72%); (3) Be on friendly terms with the press (53%); (4) Take the initiative (47%); (5) Don't try to 'pressure' newsmen through the business office (30%); and (6) Be prompt (28%).—*Public Relations Letter (Indiana Manufacturers Assn.).*

"Wage Law Deprives"

The best you can say for the politicians agitating for a minimum wage law is that they are economic ignoramuses. If they knew anything about how the law works you would have to put them down as mean—unconscionably mean.

For a compulsory wage fixed above what the market will pay for marginal jobs has the effect of throwing out of gainful employment those least able to earn some sort of a living—the physically handicapped, the mentally deficient, the aged, and the part-time worker.

It does not raise their incomes, as the politicians would lead us to believe; it deprives them of a chance at any income.—*"The Freeman."*

In Behalf of Progress . . .

Technical Manpower Problem Calls for Action

When a young man with a masters degree in food technology was released from the Armed Forces recently, he was interviewed for 26 positions!

There you have one dramatic measure of the technical manpower problem now facing our industry. There are many others.

In a survey of the technical-talent shortage in the industrial field, National Science Foundation finds food firms suffering from lack of adequate personnel. One company reports that research is impeded.

There are 20 jobs for every applicant in the enterprises that serve the poultry field. And it can use between 2,500 and 3,500 graduates in the next five years. So reports the new booklet *There's a Career Ahead for You in Agriculture.*

This year's graduates from major food technology and engineering schools were far too few. On the average, five jobs were available for every graduate with a BS degree, six for each man with an MS, and three for the PhD.

Only about 300 food technologists and engineers have been graduated so far in 1955, according to IFT, 76 of these having an MS degree and 59 a PhD.

As bad as is the shortage, it's likely to become worse. Not enough is being done to interest young technically minded people to study for careers in the food industry. The rate at which technical talent leaves the industry is higher than for most other major industries. And because of a general shortage of professionally trained people, there is strong competition from better publicized fields for technical help.

Several things must be done to correct the situation. And here are suggestions from the heads of leading food technology and engineering schools:

Do promotion at the local level to influence technically minded high school graduates to take food technology or engineering when they enter college.

By a similar program, keep the college men interested in the field.

To achieve these two purposes requires that the food manufacturing and processing industry be publicized. That the nature of its operations, its importance, and its scope be explained and dramatized. That the professional requirements and opportunities be delineated. And that factors making the industry a personally desirable place to work be outlined.

Such promotion programs are vital. For one thing, the popular concept of our industry is all wrong. Too many people think of the little local cannery, or the corner retail bakeshop, when they think of the food industry. Such a picture isn't very exciting to technical people.

Other technical industries and professions are better known, seem more glamorous, and are being effectively "sold" to students in the high schools.

You can get a good idea of the competition for technical manpower by a glance at the help-wanted section in a paper like the Sunday *New York Times*. You will find four or five pages of "display" advertisements calling for engineers and offering enticing opportunities.

This situation, of course, attracts new people to these other industries and away from the great "unknown" and misunderstood food field. It also induces technical men to leave our industry for what look like greener pastures.

On top of this, the engineering associations and colleges are publicizing the career opportunities in all major fields except food. Occasionally this promotion may point to food manufacturing as one place for chemical engineers to work. But that's about as far as it goes.

All this points up another suggestion from an educator. It is that food companies organize a cooperative campaign to publicize the need for food technologists and engineers in all food company advertising.

That widespread national advertising can solve tough problems has been demonstrated time and again in recent years.

Other suggestions include donating funds to technical food schools, granting scholarships, and establishing "chairs" of food technology so that good teachers can be paid enough to hold them. Appropos of the latter is this observation from the head of one food technology school: "Some of my graduates have gotten higher salaries to start than I get now."

Particularly pertinent to the technical manpower problem are these remarks by another leading educator:

"There has been a dormant situation as regards undergraduate enrollment in food technology for the past several years. Among contributing factors is the apparent reluctance of the food industry to help establish and support the necessary educational facilities . . . and to encourage the essential basic curricula to the end that graduates might assume a recognized professional status."

It is urgent that you and others take a hand in solving the technical-manpower problem to insure progress in our industry.

Meanwhile, food companies should take good care of technical talent already in the field to keep it there. Pay adequately, delegate authority, provide still bigger opportunity.

1. Call us up.

2. Tell us what you want to mix.

3. We'll give you guaranteed mixing results.

Need to mix fluids? Here's how to **do it right . . . without risk**

Get yourself a mixer recommendation that takes *all* the risk out of fluid mixing.

Every LIGHTNIN Mixer you buy is unconditionally guaranteed to do the job for which it is recommended. This guarantee protects you . . . relieves you 100% from responsibility for successful mixing results. It saves you engineering time, and banishes guesswork from fluid mixing.

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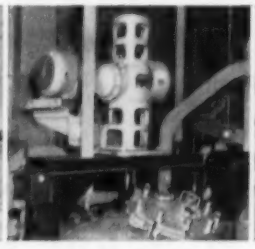
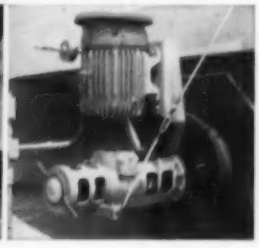
(If your requirements are very unusual, he may take a day or so—seldom longer.)

If you don't have his name, write or phone us direct for a recommendation and price.

This extra-fast MIXCO service costs not a penny—can save you plenty. Why not get the facts you need *today?*





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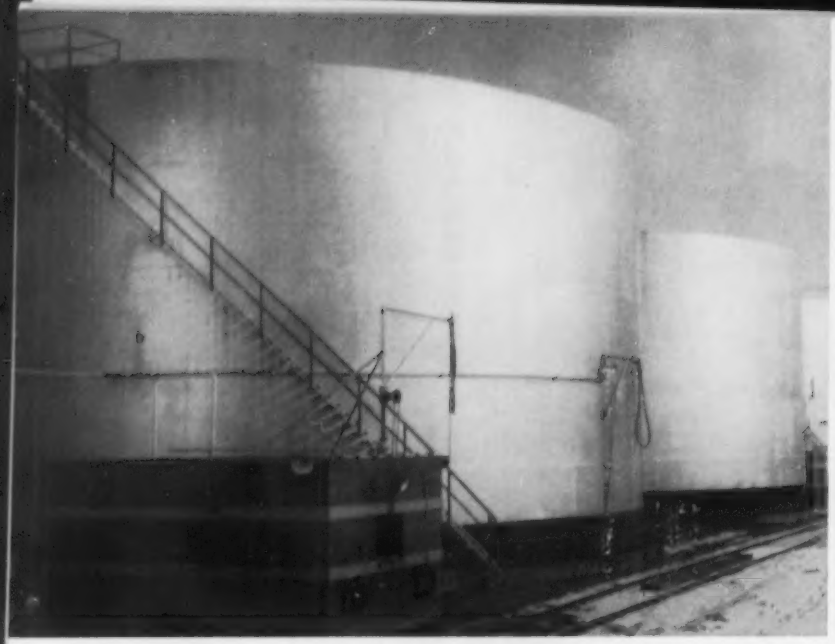
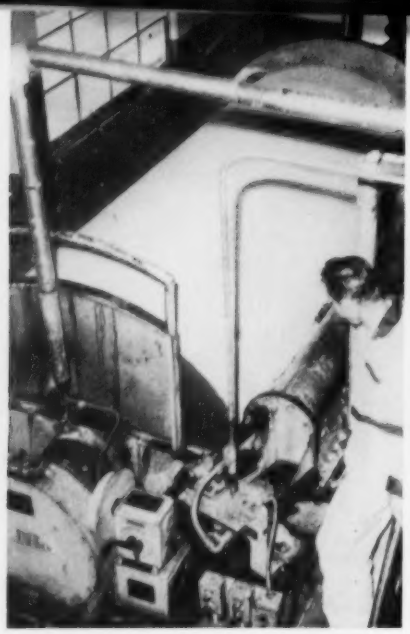
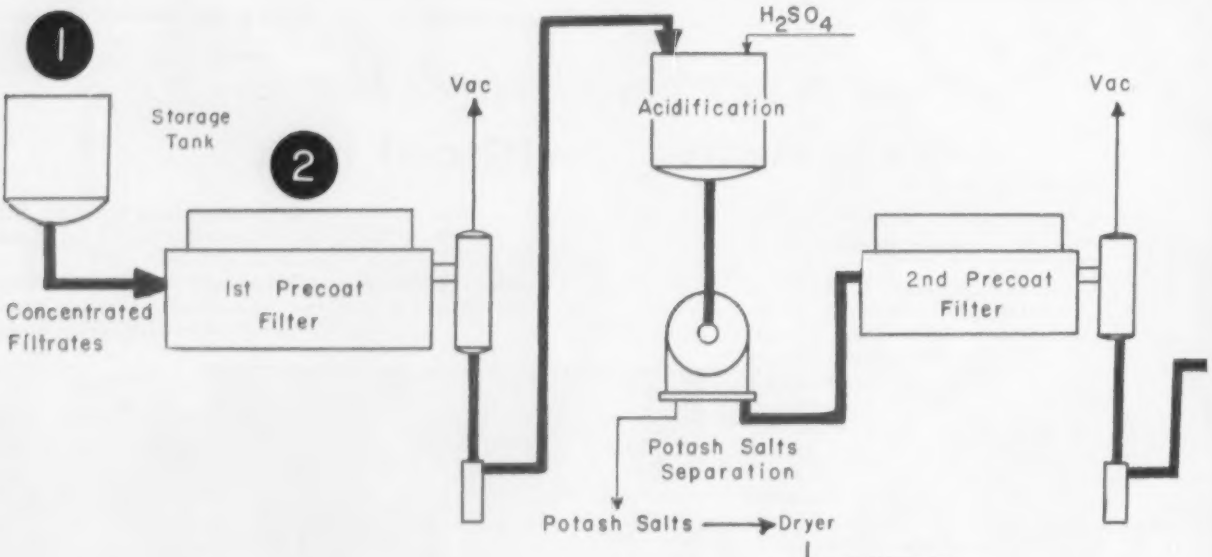
TURN PAGE FOR FOLDOUT FLOWSHEET →



1 **7,500-TON STORAGE TANKS** receive concentrated liquid protein from adjacent beet-sugar refinery and Steffen filtrate by RR tank car.



2 **ROTARY PRECOAT FILTER** removes solids from crude filtrates.



Precision Processing of MSG

Advanced Line Engineered to Utilize Residues of Beet Sugar Molasses . . . Feed and Fertilizer Byproducts Also Recovered

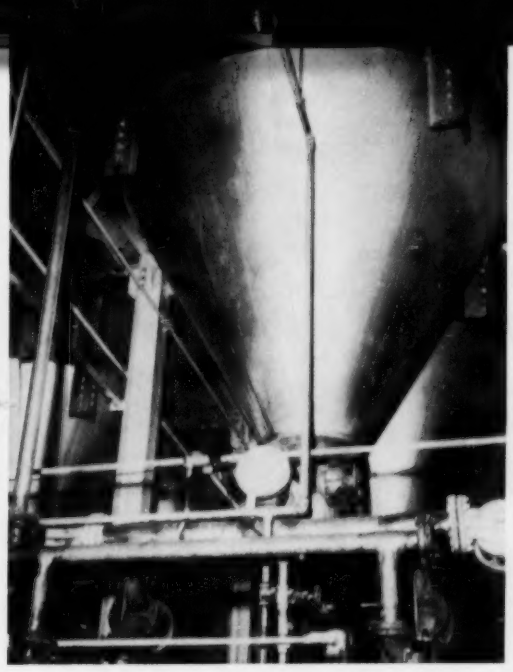
C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

Straight-through processing, marked by top-efficient materials handling, typifies production of monosodium glutamate at Great Western Sugar Co.'s new multimillion dollar plant at Johnstown, Colo.

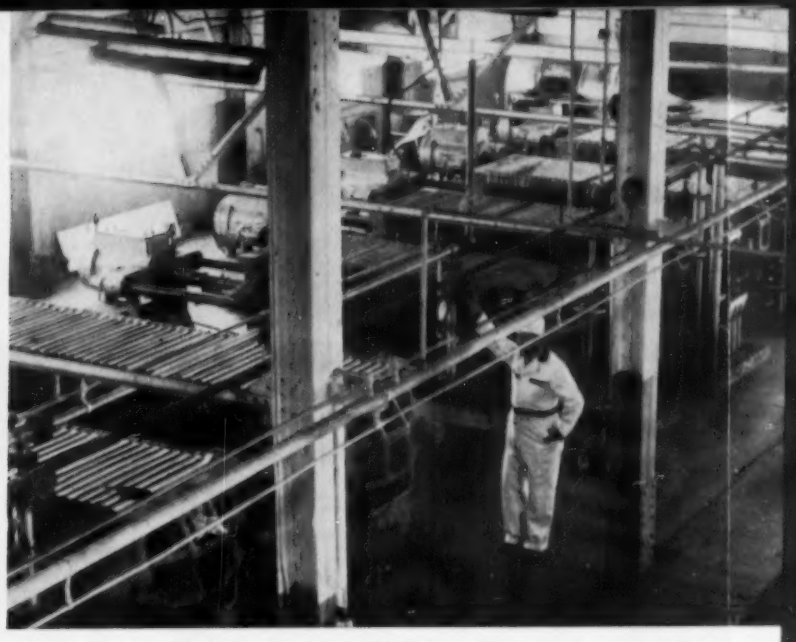
Particularly notable is the new, economic use of formerly wasted beet-molasses residues, together with the recovery of valuable feed and fertilizer byproducts.

Located only 100 yd. from its beet-sugar molasses refinery, the plant receives steam, power, and water from that facility. Latter also supplies the new operation with about two-thirds of its raw materials—treated molasses residues. Remainder (concentrated Steffen filtrate) arrives by rail tank car from company's other factories.

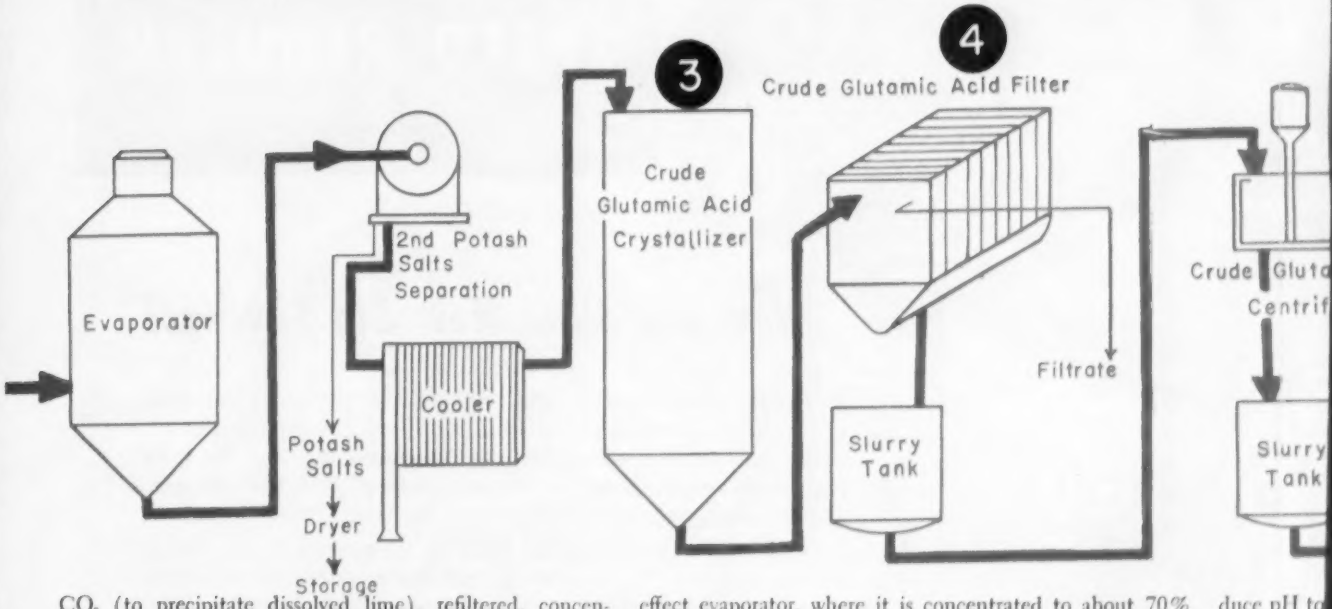
Both materials are prepared by reacting diluted beet-sugar molasses with an agent that precipitates sugar. Unique at the Johnstown plant is the use of barium hydroxide, while quicklime is employed in the Steffen process. Sugar is precipitated as barium or calcium saccharate and recovered by filtration. Resulting filtrate is heated, treated with



3 CRYSTALLIZERS precipitate crude glutamic acid from desalted filtrate.



4 PLATE-AND-FRAME FILTER PRESSES separate crude glutamic acid cry which go to centrifugals. Effluent is neutralized for end-use as cattle feed.



CO_2 (to precipitate dissolved lime), refiltered, concentrated, and sent to the MSG plant.

Steffen and concentrated Johnstown filtrates are stored —Point (1) on accompanying flow diagram—in four 7,500-ton tanks adjacent to the plant. Moving from the storage tanks, the two concentrates are proportioned in a mixing tank and pumped to a precoat filter —Point (2)—to remove small amounts of suspended solids.

Filtered material is then pumped through a series of three mixing tanks in which pH is reduced to 3.2 by addition of concentrated sulfuric acid. Flow of acid is automatically regulated by pH controllers and recorders (Leeds & Northrup).

Since concentrated filtrates contain large amounts of potassium salts, potassium sulfate formed in the acidification is removed in a continuous centrifugal (Bird). Separated salts are slurried with water, sent through another continuous centrifugal to remove residual filtrate, passed through a rotary dryer, and stored as fertilizer.

Filtrates from centrifugals are pumped through a second precoat filter to remove suspended solids formed during acidification. This filtrate goes to a continuous single-effect evaporator, where it is concentrated to about 70% solids.

During evaporation, additional potassium sulfate crystals are produced. They are also separated in a continuous centrifugal, washed, dried, and conveyed to storage. Filtrate resulting from this operation is cooled and pumped to large vessels—Point (3)—where crude glutamic acid crystallizes in about five days.

When crystallization is substantially complete, material is sent to plate-and-frame filter presses—Point (4)—for the first separation of crude glutamic acid. Effluent from these presses is neutralized with gaseous ammonia and pumped to outside storage tanks for ultimate use as cattle feed. Crude glutamic acid crystals from filters are slurried, pumped to high-speed, batch centrifugals, and thoroughly washed with water to remove soluble impurities.

Washed, crude crystals are dropped from the centrifuges and dissolved in water and sodium hydroxide. This solution of crude monosodium glutamate is then treated with vegetable carbon—Point (5)—and filtered. Filtrate is passed through a series of tanks to which hydrochloric acid is added in an automatically controlled stream to re-

duce pH to
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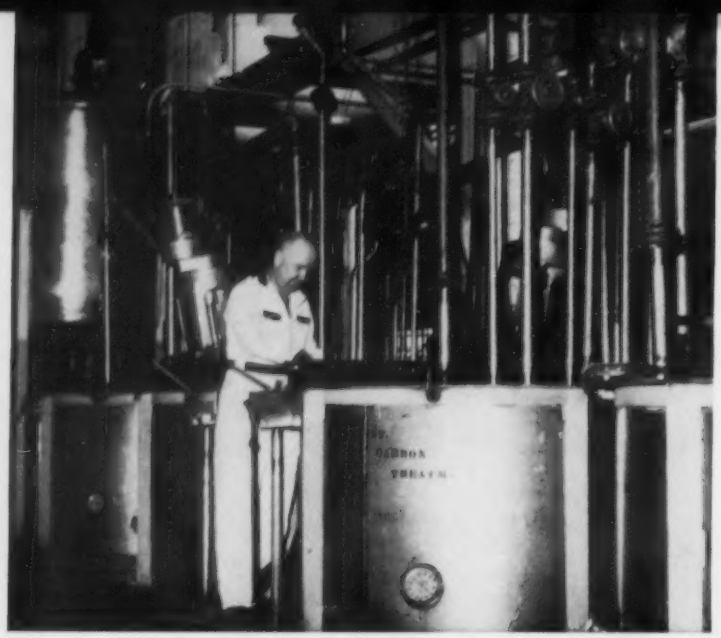
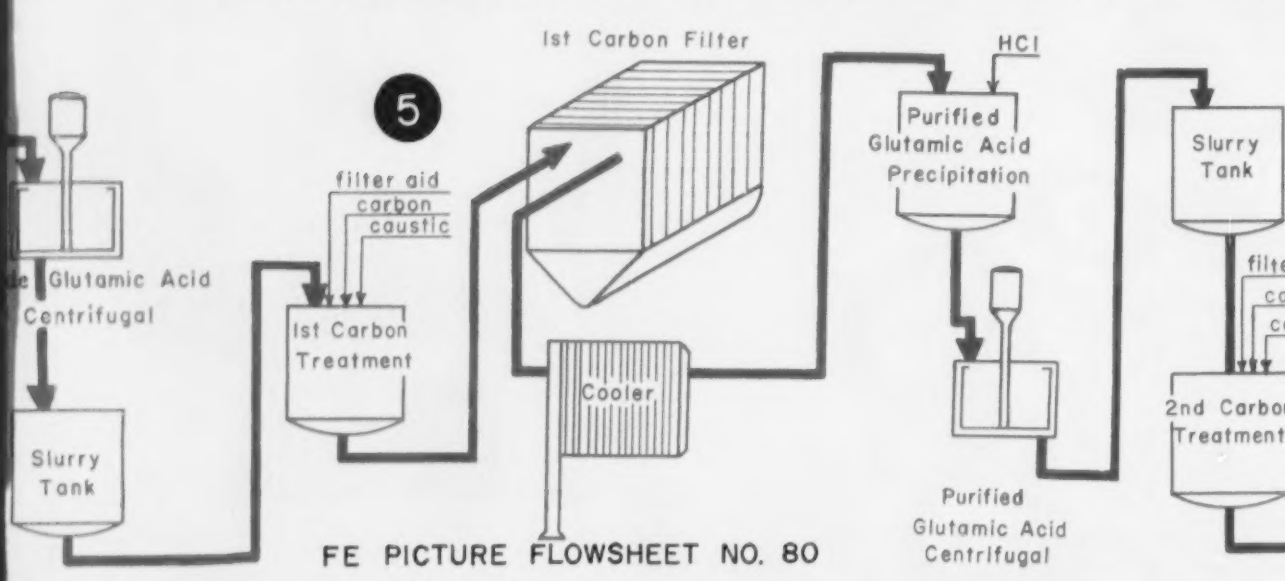


5 CARBON TREATMENT TANKS. Here, crude washed crystals are dissolved in caustic, partially decolorized, and slurried with filter aid.

6 HIGH-SPEED CENTRIFUGALS monosodium glutamate—the fin



FE PICTURE FLOWSHEET NO. 80

nce pH to about 3.2. This causes precipitation of purified utamic acid, which is then separated and washed in ntrifugals.

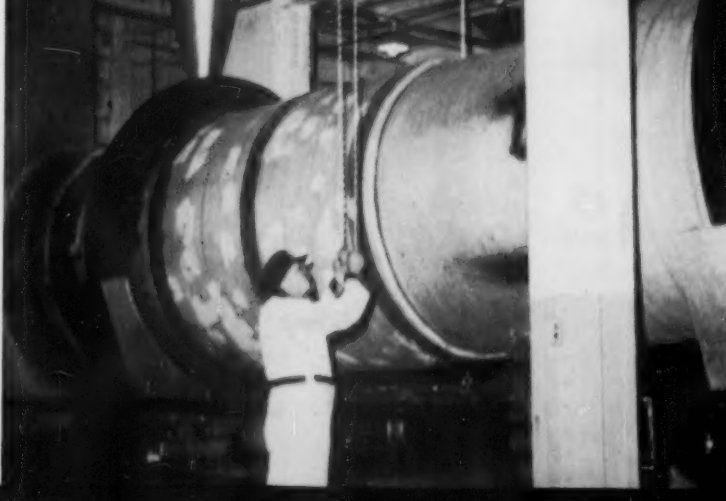
Purified glutamic acid from the centrifugals is dissolved n water and sodium hydroxide. Solution is treated with egetable carbon, filtered, and pumped to a continuous vaporator-type crystallizer for production of crystalline onosodium glutamate.

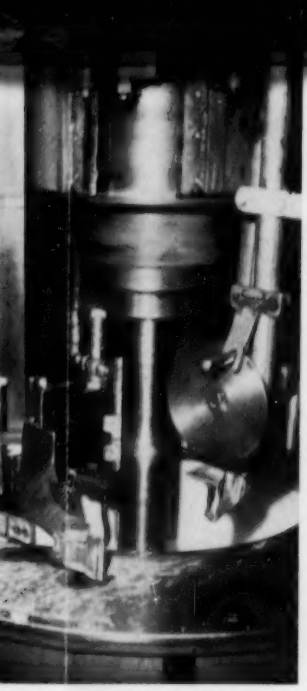
Material is drawn from the crystallizer periodically and ystals are separated and washed in a batch-type high-eed centrifugal—Point (6). After being dried, these ystals are the finished product, which is packed in 100-lb. ums (or 10-lb. cannisters or 1-lb. shakers) and sent to orage—Points (7) and (8).

A byproduct of the MSG process is a livestock feed—a otein concentrate known by the initials LPC—which has come very popular with western feeders. It is a free-owing liquid consisting of the end-product of mother uor from the plant.

Material analyzes not less than 65% solids. It contains least 30% protein (of which not more than 40% is rived from NH_3 nitrogen), and 16% nitrogen-free extract.

ROTARY KILN dries potassium sulfate which initially precipitates from cru on acidification. This byproduct is used as a fertilizer salt.

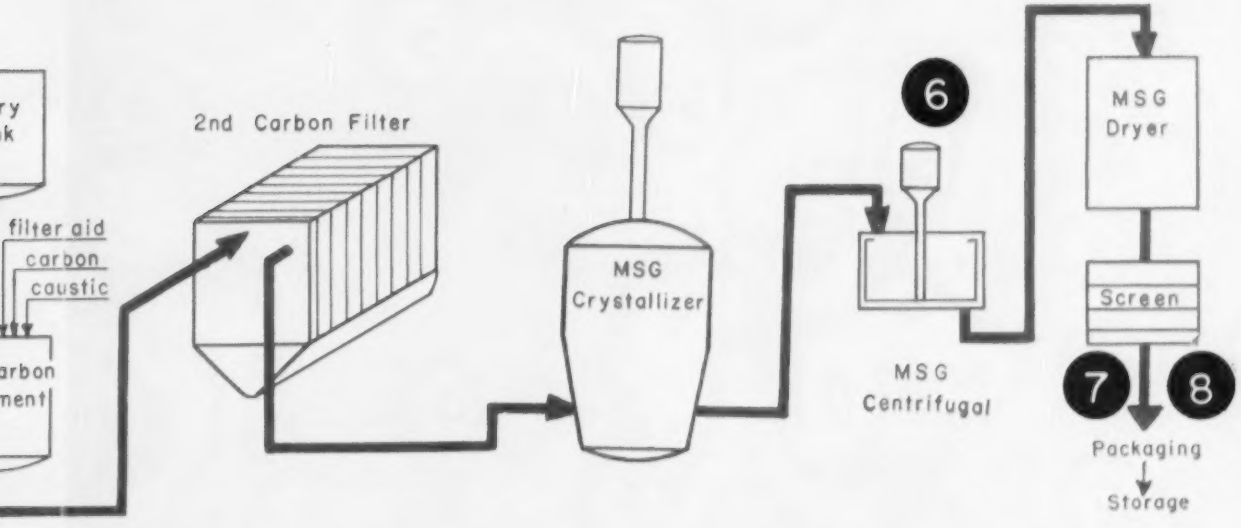




ALS wash and separate purified
e finished product.

7 DRIED CRYSTALS are packaged in 100-lb. drums with polyethylene bag liners.

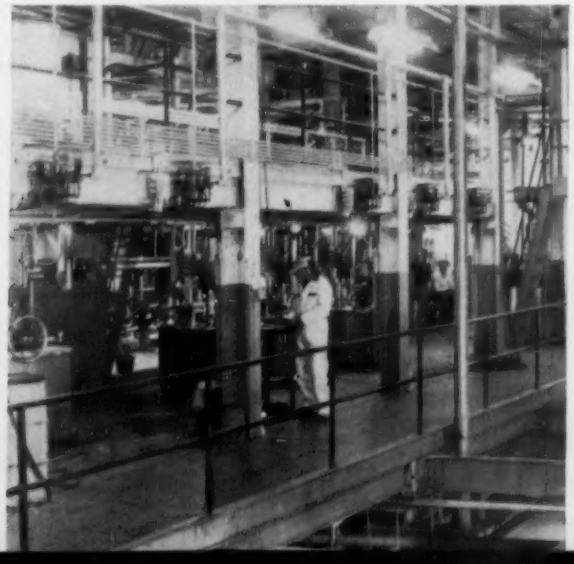
8 LIFT TRUCK stacks drums 12 to a pallet and 3 pallets high.

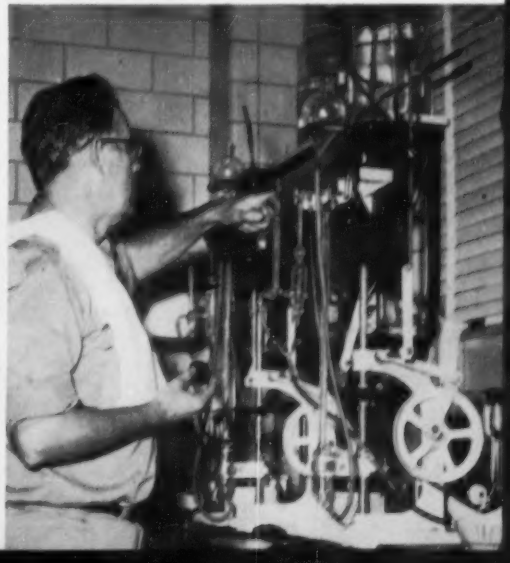


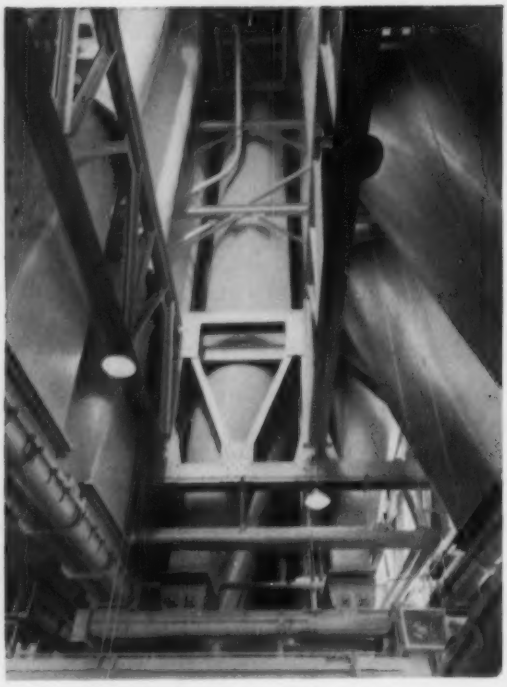
n crude filtrates

BATTERY of 1,800-rpm. centrifugals is shown in general view of new plant's second floor.

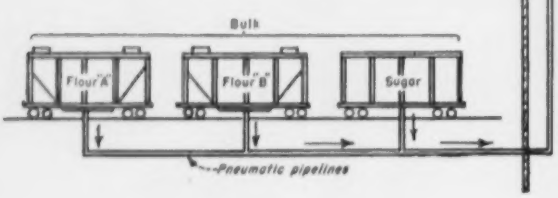
QUALITY CONTROL. Chemist checks total amino acids in factory liquors.

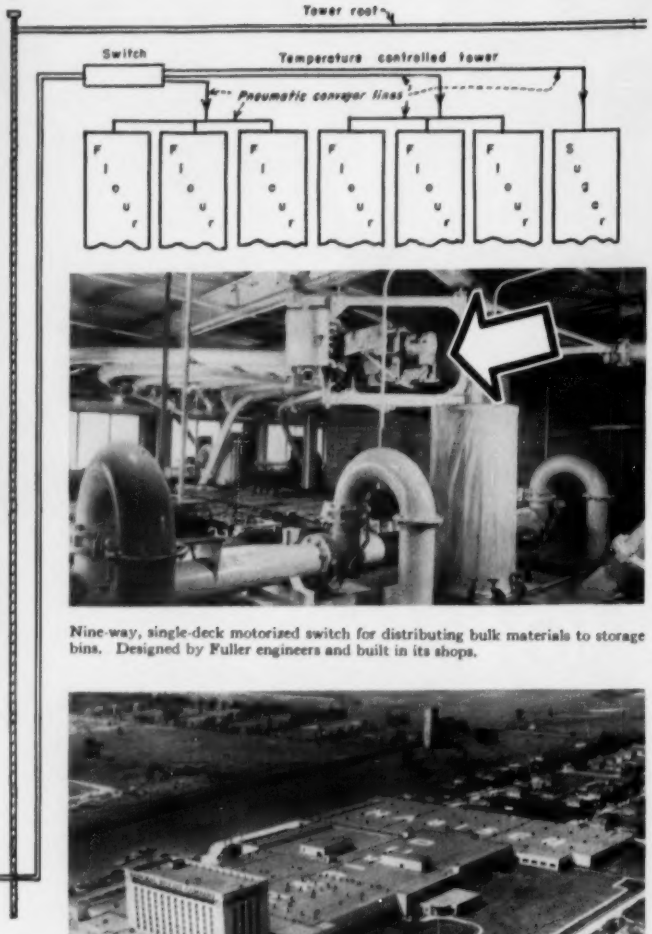






Partial view of bulk-material storage bins.





Nine-way, single-deck motorized switch for distributing bulk materials to storage bins. Designed by Fuller engineers and built in its shops.

60 million crackers per shift, at National Biscuit Company, Chicago

That's a lot of crackers, and means a lot of flour.

Major ingredients, such as flour and sugar, are received in specially-built GACX bulk cars and unloaded by the Airveyor conveying system. Materials flow directly from the cars, through dust-tight, self-cleaning, sanitary ducts to storage bins on the top floor of the bakery . . . contamination proof; no loss of material.

The latest addition to National Biscuit Company, its Philadelphia plant, will also be Airveyor equipped for unloading flour from Airslide cars to storage, and handling sugar in-plant from storage to use bins.

The Airveyor offers any bakery—large or small—many worth-while advantages . . . insures long-time operation with minimum attention. The day the Airveyor begins working for you, is the day you start saving—cancel out unsanitary conditions, further improve your whole plant operation.

For more information on the Airveyor in the bakery, ask us to send you bulletin AF-100.

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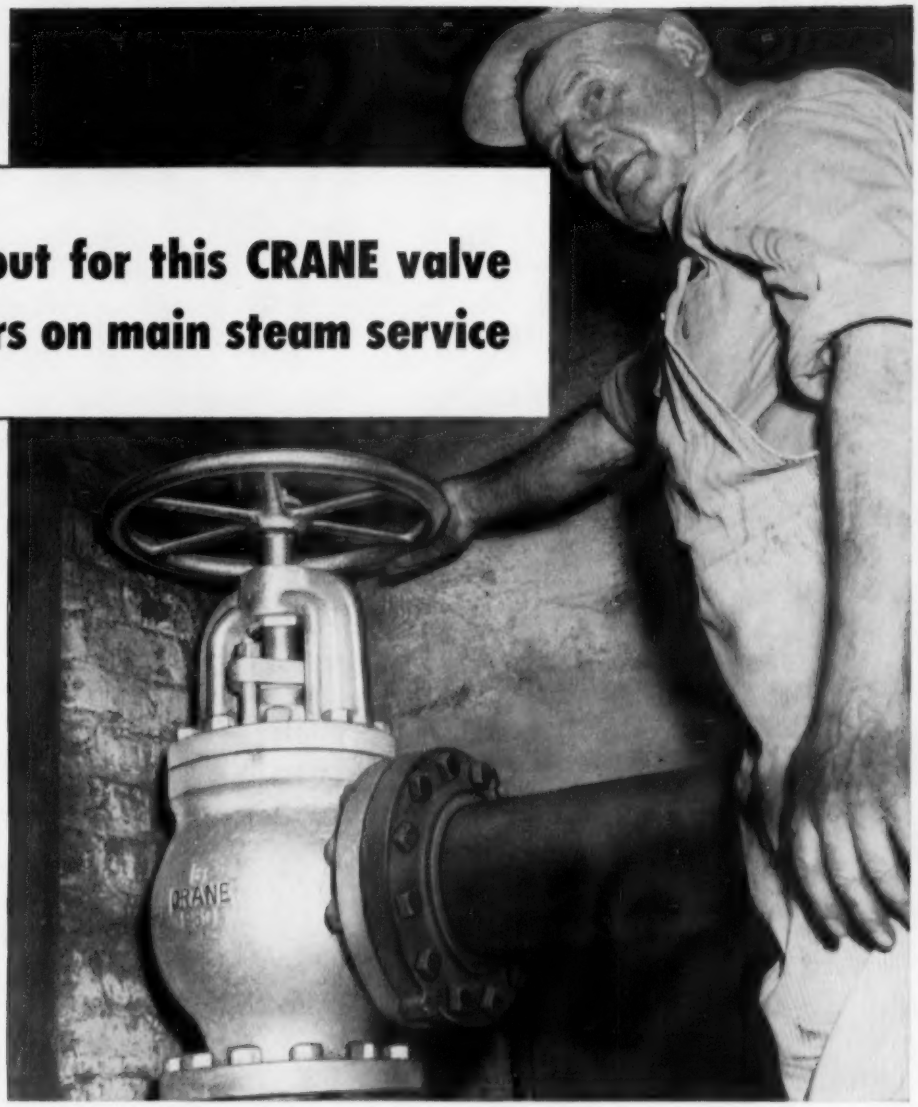

THE CASE HISTORY—Two Crane 250-pound iron body angle valves—6-inch (shown) and 5-inch size—scored this exceptional service record.

They were installed in 1915 on the main steam leads from boilers in the plant at Delavan, Wis., now occupied by The George W. Borg Corporation. In 40 years' uninterrupted service these Crane valves never failed to operate properly nor caused a shutdown. With but routine maintenance, they opened fully and were seated tight with ease under infrequent operation. Working pressure of boilers was originally 150 psi.—later reduced to 75 psi. This year, both valves were retired. The new replacements are Crane quality valves, of course.

Crane iron valves in particular need no introduction to thrifty buyers. In all grades, Crane iron castings generously exceed the requirements of equivalent A.S.T.M. specifications. Crane Ferrosteel, for instance, used in 250-pound valves is 35% stronger than ordinary cast iron.

In any pressure class, you'll find Crane quality outstanding. Choose from complete lines of gates, globes, angles and checks. Your Crane Representative can give valuable help in specifying and ordering.

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CRANE CO.

for the THRIFTY BUYER

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KITCHENS • PLUMBING • HEATING

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60 H.P. DODGE TORQUE-ARM SPEED REDUCER

New Big Size! New Big Savings!

All the advantages of shaft-mounting . . . all the proven performance and economy features of Dodge Torque-Arm Speed Reducers . . . are now available for your *big* jobs. The husky new size No. 8, in the double reduction series, has a capacity of 60 hp at 100 rpm, AGMA rating, and can be mounted on shafts up to 5-inch diameter.

The new No. 8 has all the inherent advantages of the Dodge Torque-Arm line. No foundation, no flexible couplings, no sliding base required—and there are no lining up difficulties. It is mounted directly on the shaft. The torque-arm, fastened to any fixed object, anchors the reducer. The unit is driven through any V-belt drive. Stock Taper-Lock Sheaves permit any speed ratio desired.

Another new member of the Torque-Arm line is the single reduction No. 11 (1.3 hp at 100 rpm, AGMA rating). Torque-Arm Reducers are now supplied, in both single and double reduction series, with capacities from 1 to 60 hp, output speeds from 12 to 365 rpm. For details write for special Bulletin.

Torque-Arm Speed Reducers driving the trunnions rotating an asphalt kiln.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE MANUFACTURING CORPORATION, 2800 Union St., Mishawaka, Ind.

DODGE
of Mishawaka, Ind.

ABC...and the Reader

BACK IN 1914—forty-one years ago—a group of advertisers, advertising agencies and publishers joined in a project that has come to mean a great deal to the millions who, like you, read business magazines. The project, initiated at a time when circulation claims were rarely verified, was intended to achieve and maintain higher standards of integrity in publishing and advertising practice by providing means to audit paid circulation. Out of that effort came an organization known as the Audit Bureau of Circulations, a voluntary, non-profit, cooperative association, known for short as ABC. Its symbol appears at the head of this page.

We are proud that McGraw-Hill publications were among the founders and charter members of the Audit Bureau of Circulations.

Today the Bureau numbers 3,670 members. These include advertisers, agencies, and publishers of newspapers, farm papers, general magazines and business journals such as this one. These publisher members hold their memberships and their right to display the ABC symbol in their publications only so long as they live up to the circulation standards that are established through the Bureau.

It is one thing to set up high standards; it is another to see that those standards are maintained. This latter and all-important function is performed by a staff of auditors maintained by ABC to check periodically on the circulation practices of the publisher members. When a business magazine, such as this one, joins the Bureau it agrees that the ABC auditors shall have "the right of access to all books and records." Their inspection may dig into the files of original subscription orders, payments from subscribers, paper purchases, postal receipts, arrears of payments, editorial expenses and many other significant items. Sometimes the auditors go behind the records and seek verification of purchase and payment from subscribers themselves.

The information thus obtained and certified by the Bureau then becomes available to the public and constitutes an authoritative report on the publication's circulation practices.

The advertisers and agencies benefit directly from the ABC because it provides a generally recognized factual yardstick by which the circulations of member publications can be measured and appraised. Every paragraph in an ABC report on a business publication gives the advertisers data that help them make intelligent use of the publication as an advertising medium.

But the ABC renders a service of vital concern to the *reader* as well. The Bureau audits paid circulation only, and it is through this payment, whether by subscription or newsstand purchase, that the reader keeps the editorial policy of a publication responsive to his needs. His decision to buy or not to buy records his judgment on each publication, and the ABC-audited and certified circulation reports make the sum of these judgments known to all concerned.

So the editors of ABC publications must constantly keep their editorial services up to the mark if they are to survive a competition in which the reader's right to buy or not to buy is paramount. Each paid magazine or newspaper will prosper or fail as it wins or loses the voluntary patronage of thousands or millions of readers. And—the ABC is scorekeeper in this vital contest.

Thus the publisher who submits his publication to the supervision and discipline of ABC affirms in the strongest possible manner his recognition that his primary obligation is to his readers and that he owes the standing of his publication to a voluntary demand by those readers.

All this is what makes the ABC brand on a publication so important to its readers. That respected symbol, testifying to the advertising value of the publication, serves also as a constant reminder to all concerned that the reader's willingness to pay for an ABC publication is the basic reason why it stays in business.

McGraw-Hill Publishing Company, Inc.

TRI-CLAMP *"Return Cups"* provide simple, fast disassembly for cleaning CHESTER-JENSEN HEATER

. . . can be used for "take-down" or cleaned-in-place service

• This Chester-Jensen Heater is unique in that it does not employ conventional methods of return flow. Instead, a stainless steel return cup takes the place of complex return covers or fitting assemblies. The return cup is held in place with a simple TRI-CLAMP toggle union.

The advantages of these Tri-Clover snap-action clamps are obvious—faster, simpler original assembly at lower cost—and speedy disassembly for cleaning, inspection, or replacement.

While this is a specialized application of the exclusive Tri-Clover TRI-CLAMP principle, the same basic advantages apply to the full line of TRI-CLAMP stainless steel ells, crosses, tees, laterals, etc., for use in either "take-down" or cleaned-in-place lines. When installed in "take-down" lines, the "easy on and off" feature means a tremendous savings in labor at wash-up time. When used in C-I-P lines, Tri-Clamp fittings offer important savings in both original cost and in maintenance expense.

Included on the Chester-Jensen heater system is the Tri-Clover *"Pump King,"* one of a complete line of Tri-Clover sanitary pumps — that years of service have proven will out-perform and out-last any other centrifugal pumps available to the dairy industry. These pumps feature: *Wide choice of seals — Design that actually exceeds 3A sanitary standards — Streamline heads for faster assembly and disassembly — Patented impeller for higher efficiency — Pump heads that can be turned 360 degrees to simplify installation* — and many other features which make it the most "copied" pump in the industry. *For full details, send for Pump Catalog 253.*

SEND FOR NEW CATALOG

Complete details and specifications covering the full line of TRI-CLAMP Stainless Steel Fittings are available in the new Tri-Clover Catalog 1-154. Send for your copy today.

S155

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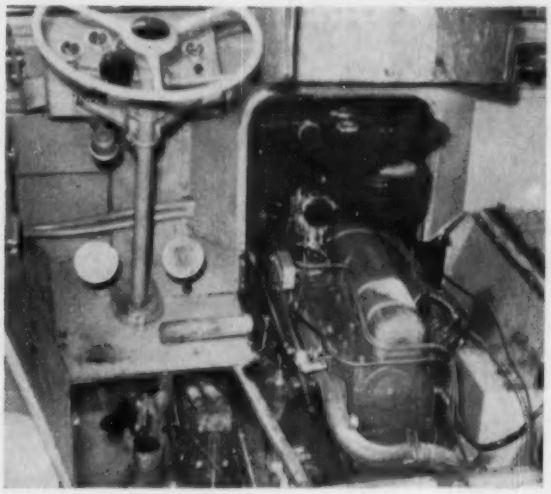
NEW EQUIPMENT & SUPPLIES



New Truck Is Versatile Multi-Stop Delivery Unit

Latest technical developments plus advanced styling have been incorporated into design of this truck to meet multi-stop delivery requirements of the entire food industry. Result is a unit termed superior in operation, appearance, and ease of maintenance.

Powered by maker's six-cylinder engine with four-speed synchromesh transmission, vehicle is said to have excellent roadability. Furthermore, maneuverability permits complete turn-around in a 40-ft. street. In addition to multi-stop usage, it has been designed for safe speeds (up to 60 mph.) on express highways, thus does not impede normal traffic.

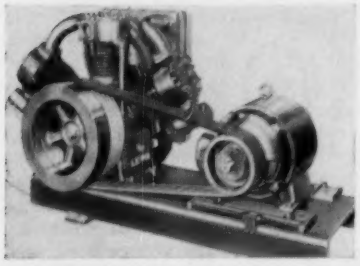
Shown above is the forward-control, 130-in. wheelbase model (Dividend Series) developed for maximum cargo capacity. Unit has a 12-ft. body, weighs 5,700 lb. and, depending on tires and springs, has a gross vehicle weight of 7,000-12,000 lb. Interior width (76 in.) and height (73 in.) permit 470-cu. ft. load capacity. Also available is a 117-in wheelbase truck with 10-ft. body.

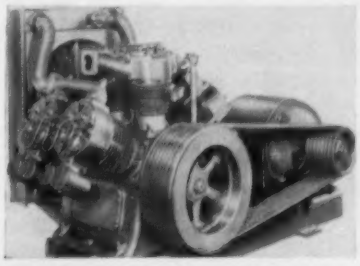
Increased visibility and streamlined styling are achieved with a wide deep windshield that affords the driver 200-deg. vision, and almost to street level immediately in front. New method of springing, double-acting shock absorbers, and a press-swivel seat provide driver comfort.

For improved maintenance accessibility, all parts of motor and transmission are easily reached from cab interior by simply removing access panels, which are treated with sound and heat-resistant materials. And to minimize corrosion, all structural members are high-tensile steel.

Optional accessories include: Flat, drop-aisle, or split-level floors; insulation and refrigeration systems; dual rear wheels; variety of bulkhead doors; heater; governor, and various types of wide-opening rear doors. Tubeless tires are available as standard equipment.—*Divco Corp., 22,000 Hoover Rd., Detroit 5.*

Circle 127A and Reader Service Card





Compact Compressors Take Minimum Maintenance

Light weight, compactness, and low maintenance mark a new line of two-stage, air-cooled, motor-driven stationary compressors.

Three-cylinder unit (left) of the "S" series is rated at 50 hp. and 260 cfm. displacement. Six-cylinder 75, 100-hp. models (right) have displacements of 415 and 550 cfm. Operating pressure is 125 psi. Balanced design minimizes wear, vibration, and noise.

Cylinders of alloy iron are cooled by a high-speed, belt-driven fan that draws air through a sectional-core intercooler and directs it over cylinders and heads. Each bank of cylinders has individual intake filters. And forced-feed lubrication, by positive plunger-type oil pump, further reduces operator attention.

Standard equipment includes a dual control that gives operator choice of start-and-stop duty of both motor and compressor, or continuous running of motor with intermittent compressing. Latter selection permits compressor cylinders to unload instead of compressing when desired pressure is reached.—*LeRoi Div., Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee.*

Circle 127B on Reader Service Card

Cement Seal Guards New, Old Surfaces

For protecting concrete surfaces indoors and out this "one coat" liquid seal is termed easily applied with mop, brush, squeege or sheep-skin applica-

tor. Coated surfaces can be opened to traffic four hours after application.

Called Cem Rem, material is designed for old and new concrete. On new areas, it holds moisture beneath the surface to prevent deposit of alkaline salts during curing. This prolongs the curing period and curbs powdering to increase wear resistance.

On old concrete, it is said to form a smooth, durable coating. By preventing entrance of water into minute cracks, it keeps them from enlarging, thus retards deterioration.—*Speco, Inc., 7308 Associate Ave., Cleveland 9.*

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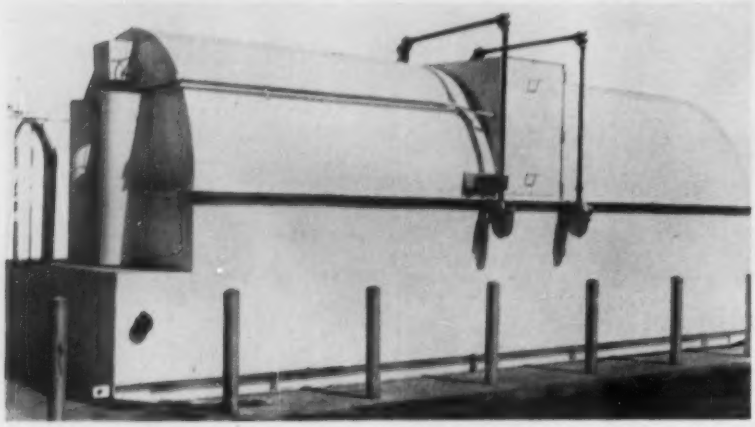

System Automates Metering of Oils and Syrups

Seen cutting bakery labor and material costs, increasing output, and providing a more uniform product is an automatic package unit that meters liquid shortening or syrup into mixers.

Called "Liquimatic," it consists of two 30,000 lb. plastic-lined tank cells enclosed by an outer shell. Space between cells and outer shell is heated by controlled air circulation that maintains correct and constant temperature for the product. With shortening an automatic nitrogen system provides an oxygen-free atmosphere for prolonged storage. And gages permit fast and accurate inventories.

Motors, pumps, and piping are available for unloading delivery trucks and supplying shortening to tanks. Lines are heat-traced with automatic thermal controls. A stainless tempering tank, jacketed and controlled with a float switch that keeps it filled, is furnished with a metering-pump and controller-dispenser system. Latter automatically measures shortening to the mixer through heat-traced stainless piping and electric no-drip valves.

Metering controller has a calibrated dial with an infinite range. Thus, desired amount may be selected by positioning the counter on the dial. Once it is set, repetitive batches are delivered without resetting when start button is pushed. Accuracy is ½ of 1%.—*Liquimatic Systems, 2657 Short St., Los Angeles 23.*

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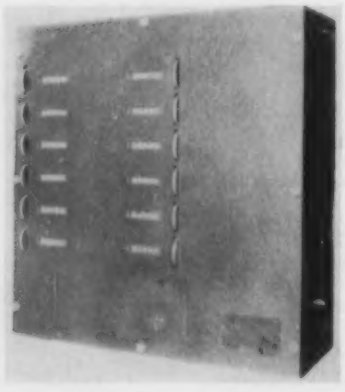

Digital Totalizer Converts Analog Scale Readings

Weight readings of any industrial dial scale may be converted to digital equivalents by use of a remotely controlled totalizer. Unit is termed specially suited as a control in receiving, shipping, or in processing of material through an automatic hopper scale that is connected to a dial scale.

Acting as a weight totalizer with a dial-hopper scale, it gives a continuous-running total weight of batches discharged regardless of number of weighings. In batching operations, totalizers are placed on a centrally located control board. This affords an immediate record of material in mixer at any time.

A servo unit drives the totalizer. With dial-hopper scales, graduations traversed by the dial pointer as it moves from full-load reading to zero, are added up by the totalizer. Weights are recorded within one graduation, which on the standard dial scale with a 200-lb. capacity, is 0.2 lb.

Totalizer is only operative as the pointer returns to zero. As the hopper scale fills, and the pointer moves from zero to full-load reading, totalizer is disengaged automatically.—*Richardson Scale Co., Van Houten Ave., Clifton, N. J.*

Circle 128B on Reader Service Card

Separates Egg Yolks According to Color

This electronic device automatically separates egg yolks into two color classifications according to Neppco standards. Furthermore, its application is seen expanding to other branches of the food industry.

Designed for use with automatic egg-breaking and separating machines, unit operates with 98% accuracy in commercial runs at rates exceeding 125 per min. Called Color Discriminator, it incorporates a light source, automatic voltage regulation, filtering system, photoelectric pickup and amplifier.

In operation, collimated light from machine is reflected into photoelectric tube at an angle that minimizes effect of spectral light. Device then actuates a tripper that directs yolk-carrying cups into predetermined channels. Cabinet housing the components mounts directly above path of cups without having to modify standard egg-breaking machine. And no shielding is required.

Compact unit measures 11½x10x4½ in., and is easily detached to permit cleanup.—*Food Systems, Inc., 6083 Estates Drive, Oakland 11, Calif.*

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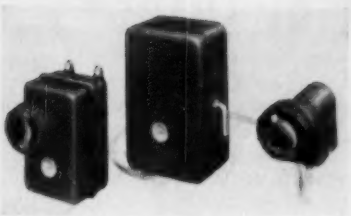

Photoelectric Controller Has Many Applications

Increased operating distances plus high speed are advantages cited for a new ready-to-use photoelectric control system (Set P4L). It covers distances up to 100 ft. and affords speeds up to 600 operations per min.

Applications include materials-handling control, use with mirrors to provide "curtain of light" protection of large work spaces, operation of wide factory doors, and visible-beam system for intrusion alarm.

Long-range set has a remote phototube with an extended lens system. High-sensitivity offers positive action under widely varying light conditions and interference caused by vapor or dust. Plug-in chassis provides simple installation and minimizes down time. Relays are actuated on completion of the beam. *Photoswitch Div., Electronics Corp. of America, 77 Broadway, Cambridge 42, Mass.*

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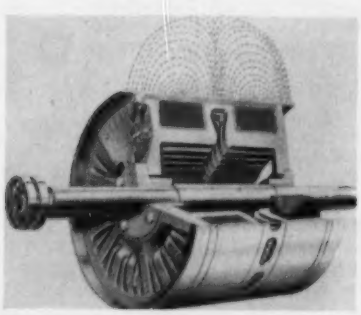

Conveyor Pulley Magnet Has Improved Design

Equipment requirements and power costs for removing tramp iron in conveyor operations may be cut by use of a new 2-coil electro-magnetic pulley.

New design reportedly produces a more effective flux pattern with a deeper magnetic field at center of pulley, thus conforming to normal conveyor load. Unit is available in a variety of widths and diameters ranging from 12 to 60 in.—*Stearns Magnetic Inc., 628 S. 28th St., Milwaukee.*

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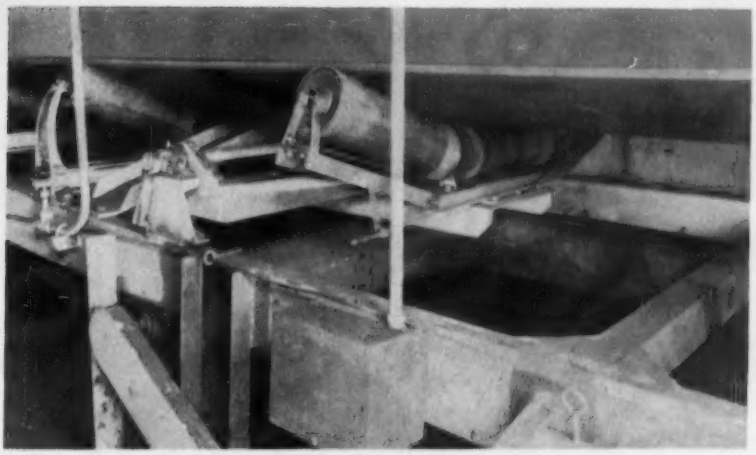

Electrical Unit Continuously Weighs Solids in Transit

An accurate system for weighing in transit flow of material on a belt conveyor combines large-dial indication, a chart record of instantaneous flow rate, and a totalized counter reading of accumulated tonnage.

Called Belt-Meter, the technique is termed easily adaptable to use of remote indicators and can be supplied with signalling and automatic control accessories. Unit can also be arranged for proportioning flow of other liquids or solids to flow of material on belt.

System operates by measuring belt speed and weight of material on it. An industrial tachometer generator is driven from the belt to produce a voltage proportional to the belt's speed. This voltage is applied to a strain gage—a force-sensitive load cell that electrically measures weight of material on a belt section.

Load cell develops an output voltage proportional to product of belt speed and weight, with no moving parts or mechanical linkages. This voltage is then measured by a specially modified potentiometer. Latter, containing calibrating adjustments, displays instantaneous rate on large circular dial and makes a 24-hr. circular chart. Instrument also contains an integrator which indicates accumulated tonnage on a small counter.

Potentiometer can be placed in any convenient location, such as a foreman's office, which may be up to 5,000 ft. from the conveyor. In addition, remote indicators may also be placed at locations convenient to other personnel. All mechanical equipment at the conveyor is located between upper and lower strands of the belt. Load cell is mounted in a specially designed carriage that requires no additional steel structure or housing.

Since no moving parts or delicate linkages are required, equipment is said to be rugged and not affected by dust, rust, moisture, and temperature changes. Temperature compensation is provided in the electrical circuit. Recording instrument should be installed in a heated area since it contains a standard cell.

Installation is simplified by lack of structural and mechanical work necessary at the conveyor. Servicing and calibration are facilitated by nature of the apparatus and by a simple dead-weight checking means provided at time of installation. Since motion of weighing equipment is only a few thousands of an inch, changes in belt tension have a negligible effect on accuracy.—*Trans-Weigh Co., Wayne, Pa.*

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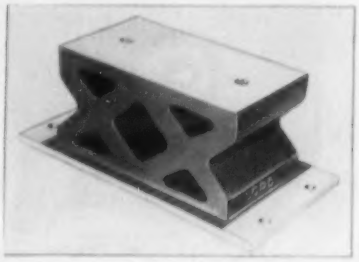


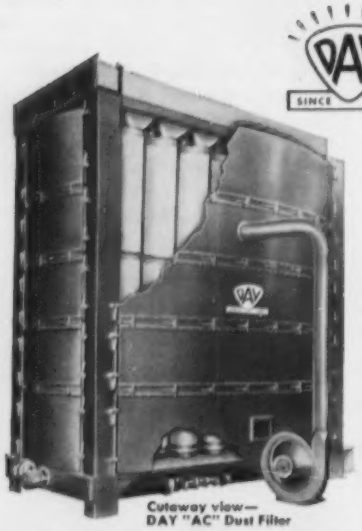
Rubber Lattice Mountings Curb Vibration, Noise

A new line of bonded-rubber lattice mountings offers a high degree of vibration and noise isolation, particularly in the low-frequency, high-amplitude range. Capacities range from 250 to 3,000 lb. and static deflections from ¼ to 1½ in.

Easily installed mountings have

50 Years have changed a lot of things!

...including DUST CONTROL



Cutaway view—
DAY "AC" Dust Filter

KELLOGG'S MODERNIZATION PROGRAM INCLUDED DAY DUST CONTROL

The DAY Company engineered, manufactured and installed modern dust control at Kellogg's large Battle Creek plant. The "heart" of these systems is the DAY "AC" Filter. Bulletin 528-R explains in detail why so many well-known companies choose DAY Dust Filters. Write toDAY for your copy.

Man's accomplishments in all fields in the past 50 years are nothing short of spectacular. Compare the 12 second flight by the Wright Brothers in 1903 with the 3 hour and 46 minute *non-stop* transcontinental flight made March 9th, 1955. Striking progress in dust control equipment has also been made. When measured against the modern DAY High Pressure Reverse Jet Dust Filter, "rapping" or "shaking" type filters are simply out-of-date.

The DAY "AC" Dust Filter, made under DAY and Hersey patents, is the *modern* filter to match *modern* methods. It handles up to *five* times more dust laden air per square foot of cloth area than out-moded conventional type filters. At the same time this modern DAY Filter requires one-third less plant space.

DAY "AC" filter tubes are cleaned *automatically* and *continuously*. Self-adjusting cleaning rings clean the filter tubes and dislodge trapped dust, using high pressure reverse jet air. This cleaning method improves filtering effectiveness and lengthens filter tube life.

EVIDENCE OF DAY "AC" DUST FILTER EFFICIENCY is proven by the fact that 87% of our filter production is for reorders from users. For detailed information about the modern DAY "AC" Dust Filter write toDAY for your copy of Bulletin 528-R.

The DAY *Company*

817 Third Avenue N. E., Minneapolis 13, Minnesota

IN CANADA: P. O. Box 700, Fort William, Ontario
Branch Plants: Buffalo, Fort Worth and Toronto, Ontario
Representatives in Principal Cities

STOP AIR POLLUTION with DAY DUST CONTROL

sandwich construction—a latticed rubber section bonded to horizontal steel plates at top and bottom. This design permits shock load to be carried by rubber in shear, thus providing for horizontal stability. There are no moving parts so lubrication is not required and noise transmission is eliminated. Damping characteristic of elastomer stops excursion of machinery when passing through resonance in starting or stopping.

Furthermore, unit's large deflection minimizes low-frequency disturbances to provide effective isolation. Where operating speed of machine to be mounted is very low, mountings may be installed in series for greater effect. —*Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.*

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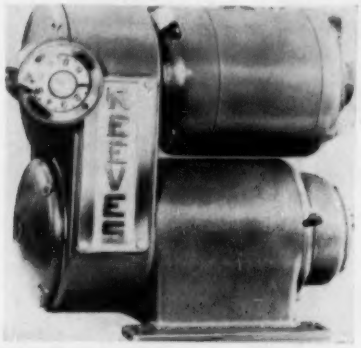

Minimum Space Required For Redesigned Drive

This 1-hp. variable-speed drive, redesigned to meet exacting standards of size and versatility, reportedly has wider application as standard equipment on machinery or in other industrial service.

Called No. 100 Vari-Speed Motodrive, vertical model requires maximum space of 16⅞ x 21¼ x 11¼ in.—a saving of 20% over previous design. Unit combines maker's "weatherized" motor, speed-changing device, and heat-treated helical-gear speed reducer, where required, in one package. Drive is available in speed ranges from 2:1 through 8:1 in 112 different assemblies.

Also included is a new spiral-groove lubrication system for covering all sliding surfaces. In case of excessive lubrication, overflow outlet carries excess lubricant away from disk faces and V-belt. All-position hand wheel control is standard, but mechanical automatic and electric remote controls are also available.—*Reeves Pulley Co., Columbus, Ind.*

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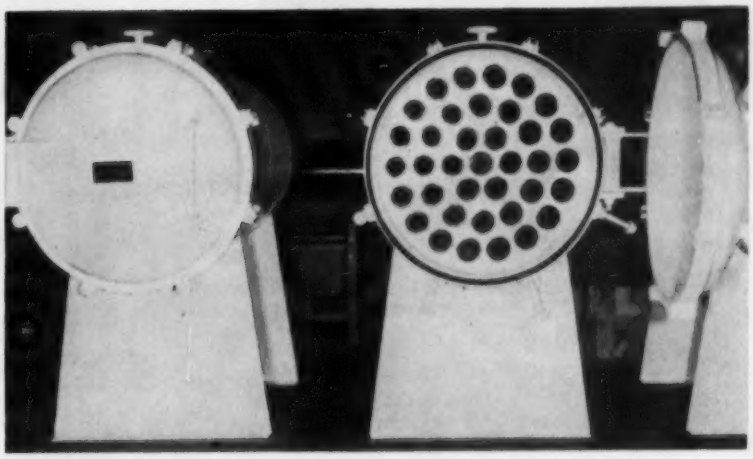


Tubular Filter Is Versatile Small-Operation Unit

Designed for simpler operation and low maintenance on smaller filtrations, this tubular unit is offered: (1) As a polishing filter for corrosive or non-corrosive liquids of low-solid content, (2) as a trap filter in series with other clarification equipment for removal of fines, and (3) for filtering run-off when cleaning larger filters.

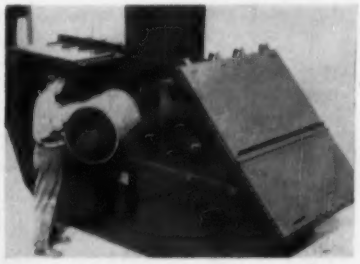
Standard units vary in size from 1 to 36 tubes with filtration areas from 2.4 to 86.4 sq. ft. Perforated metal tubes are made of material selected for the requirement. Shells and covers may be of carbon steel, steel with rubber, or stainless. Filters are available complete with pumps or furnished to fit into existing process lines.

Unit is prepared for use by rolling flat sheets of filter paper and inserting them into tubes. Sealing rings are tapered, and rear end of tube is domed to fit the liner to the tube. Fluid enters from the back, passes through inlet tube, and is dispersed by domed covers into perforated tubes. It then moves through the tubes and passes out the perforated wall through filter paper.

When cleaning is necessary, papers are easily withdrawn and replaced. Each tube is removable, and seals off the filtrate from unfiltered liquid with a rubber O-Ring. Entire cleaning operation is fast because liners and tubes stick firmly in place.

Filter may be used for intermittent or continuous operation with or without precoat. Chamber can be emptied without losing cake, and solids may be recovered in dry form.—*Industrial Filter & Pump Co., 5904 Ogden Ave., Chicago 50.*

Circle 131B on Reader Service Card



Detachable Containers Ease Bulk-Material Handling

Bulk loads of process or waste materials may be handled efficiently and economically with use of a new system called Load Lugger. Employed are hoist-bodies for standard truck chassis and containers for all types of loads.

The hoist-body is a truck body with a flat bed and a pair of hydraulic-powered hoisting arms for picking up, dumping, and putting down containers. It is easily mounted on any standard chassis and operated by truck driver from his cab. Standard units handle payloads of up to 18,000 lb., while special models have greater capacities.

Containers comprise a variety of open and closed types for handling solid materials, powders, sludge, liq-

STOKESWRAP

packaging assures impulsive sales appeal at low cost *Automatically*

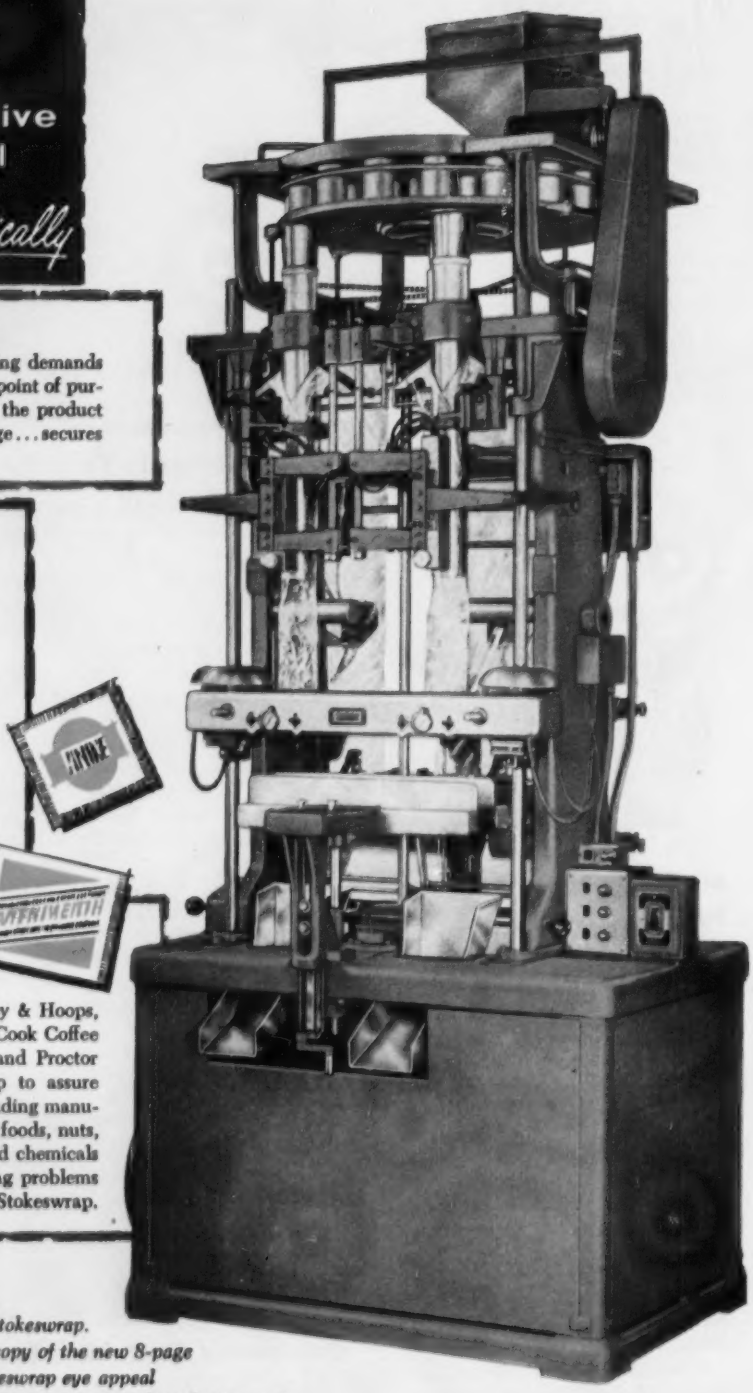
FACT #1

Modern retail merchandising demands packaging that sells at the point of purchase... that helps *display* the product ...*protects* it from damage... secures *attention* on the shelf.

FACT #2

A Stokeswrap package gives your product its own *showcase*... couches it in an *attractive background*... styles it with *eye appeal* because...

Stokeswrap forms the package from almost any heat sealing material *preprinted as you desire,* fills it with a *precisely* controlled amount of product ...seals it against air and moisture... codes and tags the package if you wish ...*and it does all this automatically at speeds up to 140 per minute!*



FACT #3

General Mills, Inc., Hawley & Hoops, Inc., Bluehill Foods, Inc., Cook Coffee Co., Avon Products, Inc., and Proctor & Gamble use Stokeswrap to assure sales appeal. Many other leading manufacturers and processors of foods, nuts, candy, coffee, cosmetics and chemicals have solved their packaging problems equally successfully with Stokeswrap.

If your products are fighting for attention on the retailer's shelf, investigate Stokeswrap. Write today for your copy of the new 8-page catalog P-801 and discover how Stokeswrap eye appeal can help create more impulse sales for you!

STOKES & SMITH CO.

4914-O SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

Pacific Coast: SIMPLEX PACKAGING MACHINERY, INC., 534—23rd AVE., OAKLAND 6, CALIF.

fmc

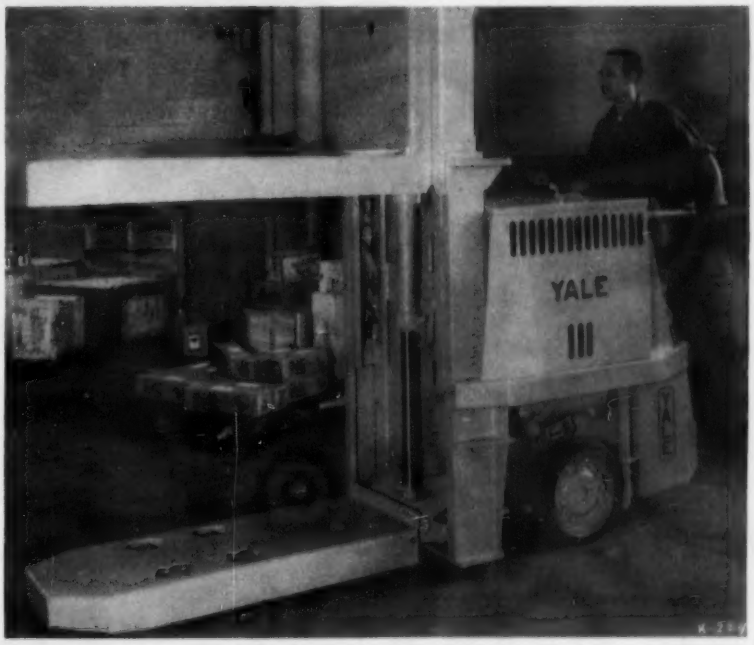
SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

uids, and gases. They are tilt-dumping, which allows deep leak-proof bottoms, and are constructed of welded steel. Standard containers hold from 1½ to 14 cu. yd., and pallet-type containers handle free-standing and unit-packaged material.

Operation calls for a number of containers to be placed at strategic points for collection of material as it accumulates, thus reducing handling at point of origin. Full containers are then picked up, hauled away, dumped or exchanged for empty ones, and returned by a truck equipped with a hoist-body. This minimizes lost time as well as need for truck loading crews.

Furthermore, when not handling containers, a truck equipped with a hoist-body can be used to carry materials or equipment directly on its flat bed, loading and unloading heavy objects with its hoisting arms.—*Brooks Equipment & Mfg. Co., 2016 Davenport Rd., Knoxville, Tenn.*

Circle 131C on Reader Service Card



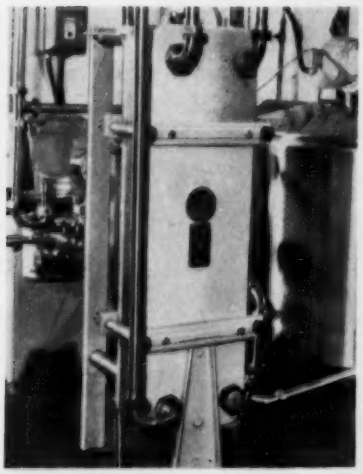
Dual-Platform Truck Handles Two Skid Loads

Fitted with two independently operated platforms, this 4,000-lb. capacity hydraulic-electric unit is said to lend versatility to truck operation.

Called Model KHM4H, its dual platforms permit transporting of two separate skid loads simultaneously. Each platform has 2,000-lb. capacity.

Truck's upper platform (69 in. long x 24 in. wide) has a maximum lift of 69 in. Height of upper platform in lowered position is 7 in., with a free lift of 35 in. available. Lower platform (53 in. long x 22½ in. wide) lifts skids 4½ in., and can be separated from the upper one to a maximum vertical distance of 62 in.—*Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia 15.*

Circle 133B on Reader Service Card



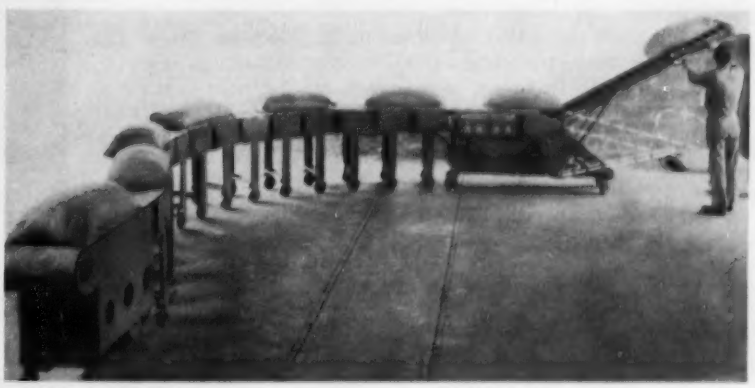
Water Consumption Is Cut By Plate-Type Cooler

Liquids such as pasteurized milk and ice cream mix may be cooled with minimum water consumption in this terminal-less plate-type cooler.

Known as Superplate Duo-Port, unit uses well, city, or refrigerated sweet water as cooling medium. It is designed for cooling from 145 to 38 F. with well or city water, and to 34 F. with sweet water. Product is taken down to within 5 deg. of water temperature in the first stage.

Standard sizes handle 1,700 lb. (200 gal.) to 6,000 lb. per hr.—*Cherry-Burrell Corp., 427 W. Randolph St., Chicago 6.*

Circle 133A on Reader Service Card



One-Man Bag Stacker Is Pushbutton Controlled

Warehouse operations, such as boxcar loading and material stacking, are said to be simplified by a new stacking unit that combines with maker's conveyor (Flex-Band) for increased flexibility. Unit stacks eight bags per minute to a height of six feet.

Stacker (right) has an adjustable boom that is mechanically raised and lowered by conveniently located pushbutton controls. Operator guides items into place and swings boom to right and left as stacking proceeds.

Conveyor consists of three cars. A drive car powers the flexible belt. Center cars, which determine unit's length, may be added or removed. The power traveler car (left) moves

THE HEAT'S ON
...and fast!

YARWAY Impulse Steam Traps get equipment hot in a hurry, and *keep* it hot.

As soon as steam is turned on—SNAP—the little stainless steel valve opens wide, discharges condensate and air *continuously* until steam arrives. Then—SNAP—the valve shuts. Equipment reaches operating temperature in the shortest possible time.

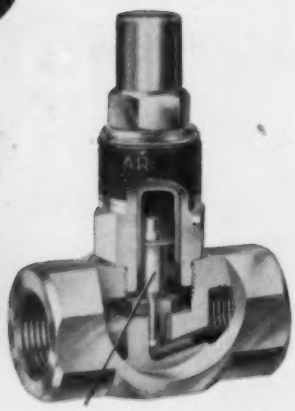
After that the little valve actually *floats on the condensate load*—maintains peak temperatures.

Other YARWAY features:

- **Stainless steel—body and internal parts.**
- **Good for all pressures without change of valve or seat.**
- **Low maintenance—one moving part.**
- **Easy installation—small size, light weight.**
- **Non-freezing at low temperatures.**
- **Six standard sizes, ½" to 2".**

Want *proof* of performance? Try a YARWAY Impulse Trap and Fine Screen Strainer FREE for 90 days in your own plant. For free trial, or free catalog, write . . .

YARNALL-WARING COMPANY
127 Mermaid Ave., Philadelphia 18, Pa.



This little valve—only moving part in a YARWAY Impulse Steam Trap—*floats on the condensate load.* It gets equipment hot in a hurry and keeps it hot!

YARWAY
impulse steam trap

OVER 1,000,000 YARWAY IMPULSE TRAPS SOLD—STOCKED BY 270 CONVENIENT INDUSTRIAL DISTRIBUTORS

the entire conveyor back and forth.

Speed of flexible belt is adjustable and it bends on a 72-deg. radius, either direction. Belt is 18 in. wide while overal length is 40 ft.—*R. T. Sheehan Co., Plymouth, Mich.*

Circle 133C on Reader Service Card

Barrel Handling Eased With Fork Attachment

By lifting 1 to 6 barrels or kegs at a time, this fork-truck attachment is said to cut brewer's cost of stacking and unstacking in warehouses, and unloading from trucks and railroad cars.

In operation, a clamp drops over barrels to be loaded, pinches them into place, and raises to normal truck lift. Containers may easily be taken from a tight stack, which can be approached from any angle. Unit (Empire) quickly attaches to any standard fork or lift truck, while use of arms increases capacity to 4,000 lb.

Maker also offers similar unit for handling 30, 50, and 55-gal. drums.—*Iron Works, Inc., 116 Chambers St., Brooklyn 31, N. Y.*

Circle 135C on Reader Service Card

Refrigeration Unit Offers In-Transit, Standby Cooling

Developed for over-the-road, semi-trailer, and wholesale truck use, this new 1½-ton electrical truck-refrigeration system provides both in-transit and plug-in standby cooling. Independent of truck's battery, system consists of an a.c. alternator, voltage regulator, rectifier, and fan and compressor motors.

In operation, the alternator, powered by truck engine, supplies 220-v. power that is rectified to 180v. d.c. Voltage regulator controls supply of d.c. power to fan and compressor motors. Temperature in vehicle is constant throughout delivery runs regardless of engine speed.

In standby operation, system can be plugged into a standard a.c. outlet, and rectifier converts power to d.c.

Fully automatic and thermostatically controlled, system is adaptable to any type truck body and engine speed range. It is available in ½ and ¾-ton ratings for milk delivery, and in 1-ton rating for below-zero temperatures of ice-cream and frozen-foods trucks.—*General Electric Co., 1-9 No. La Grange Rd., La Grange, Ill.*

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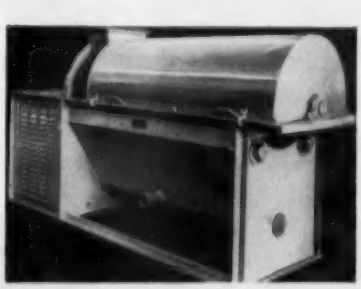


Efficient Grape Crusher Cuts Maintenance Cost

Rated at 15 to 25 tons per hour of normal grapes, this crusher is designed for easy maintenance and high efficiency at low volume. Material discharges through a removable end plate.

For uninterrupted flow, unit (Model 40) has a must sump with screw conveyor feeding into sump's suction outlet. Machine is available in stainless steel, standard construction, or in part stainless, part brass. All crushing and drying blades are of cast alloy steel mounted on a heavy shaft carried on sealed self-aligned ball bearings.

Furthermore, all lubrication points are external for easier servicing. Large easily opened protective hood and doors to motor and drive compartment are also provided.—*Valley Foundry & Machine Works, 2719 E Ave., Fresno, Calif.*

Circle 135C on Reader Service Card

Want More Information?

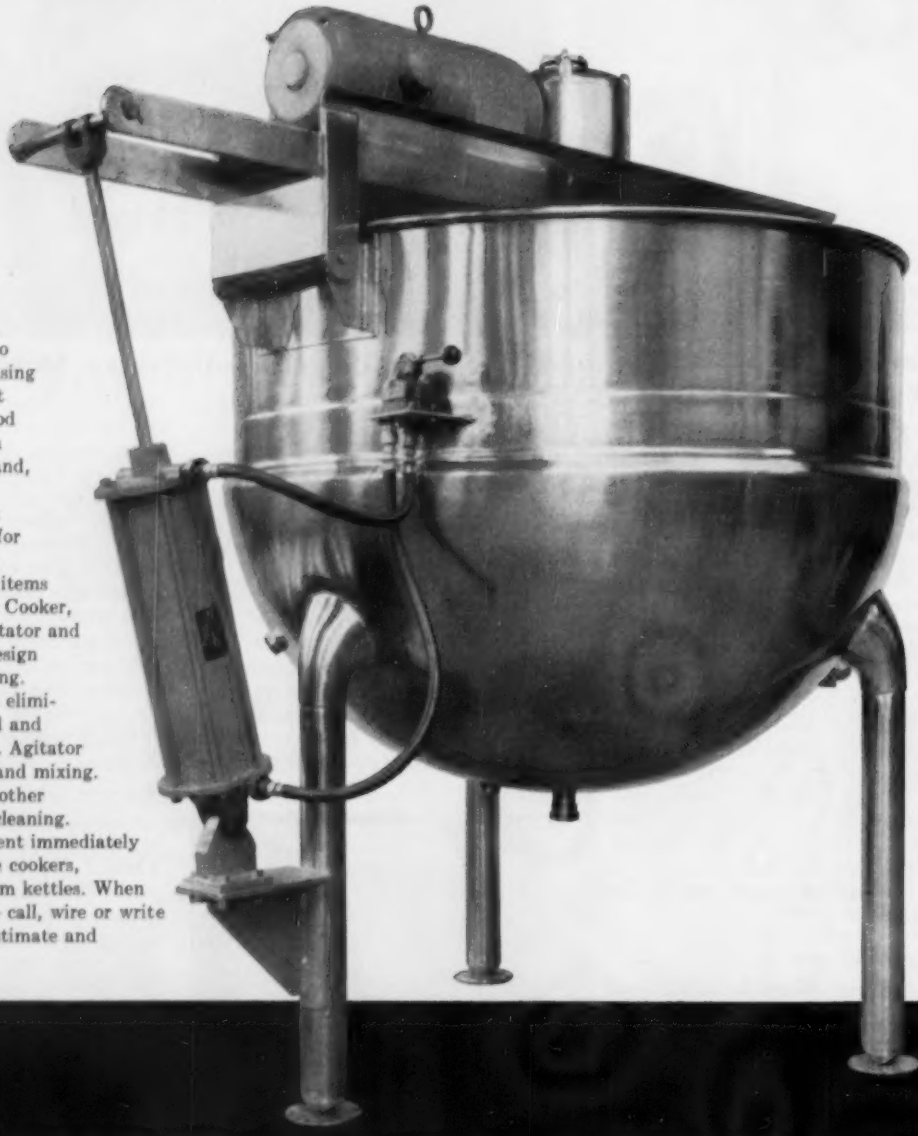
It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

When You Need a Kettle Quick!

HAMILTON

CG mix cooker



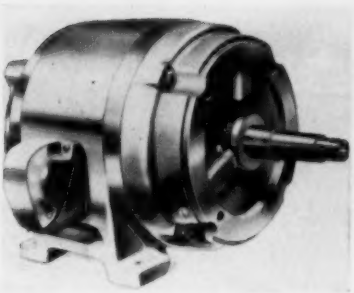
Seasonal demands force many of our customers to make last minute purchasing decisions and require fast delivery on orders for food processing equipment. In anticipation of this demand, we carry most of our standard kettles and mix cookers in stock – ready for prompt shipment.

One of these standard items is the Hamilton CG Mix Cooker, with Double Motion Agitator and Hydraulic Lift. Kettle design provides fast, even cooking. Streamlined construction eliminates crevices where food and bacteria normally collect. Agitator insures perfect blending and mixing. Hydraulic Lift gives smoother operation and simplifies cleaning.

Other types of equipment immediately available include pressure cookers, tilting kettles, and vacuum kettles. When you need a kettle quick – call, wire or write Hamilton – for prompt estimate and delivery information.

HAMILTON Copper and Brass Works

Division of Brighton Copper Works, 824 State Avenue, Cincinnati 4, Ohio



Compact Horizontal Motor Mounts Flush With Pump

More horsepower in less space is an advantage cited for a motor, with face-type registered bracket and special shaft, suitable for close-coupled centrifugal pump application.

Designated as Uniclosed, unit is built to rerated NEMA specifications with ratings from 1 to 30 hp. Pump may be mounted flush with motor by bolting to face bracket for accurate alignment. A solid flange and brass slinger are incorporated to prevent water from entering motor.

Shaft, stepped with special diameters, has shoulder and tapped holes for mounting of impeller. Shaft diameters are precision ground for accurate assembly and sealing against leakage. For additional protection against water entering motor, deflectors direct air and deflect water.

Castings are normalized for permanent accuracy and windings are asbestos protected. Split-type conduit box can be rotated in 90-deg. steps and located on either side of motor. Ball bearings incorporate a system of lubrication that removes old grease, while rotors are electronically balanced and solid cast.—*U. S. Electrical Motors, Inc., Box 2058, Terminal Annex, Los Angeles 54.*

Circle 137A on Reader Service Card

Stable Confectionery Fat Ups Product Quality

High shortening properties, increased shelf life, and neutral flavor are advantages cited for a white confectionery fat called Kokolene.

Low-melting product (98 F.) is recommended for items such as caramels, nougats, and fudge. Addition of approved antioxidant provides A.O.M. stability in excess of 100 hr. for improved product keeping quality. —*Armour & Co., Refinery Sales Dept., Chicago 9.*

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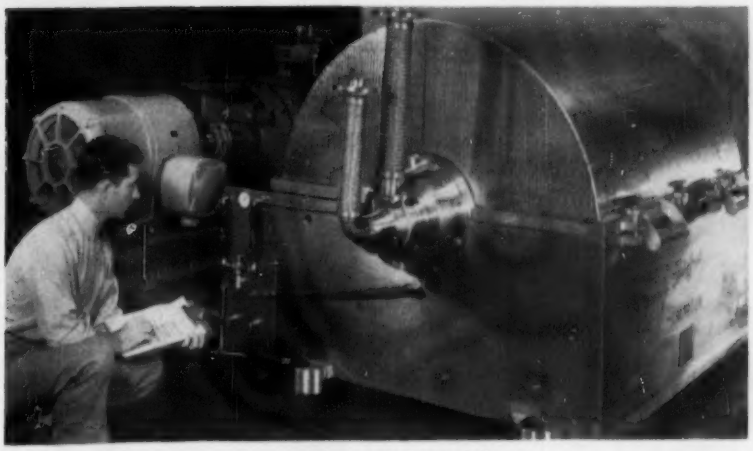


Solvent Extractor Cuts Material Holdup

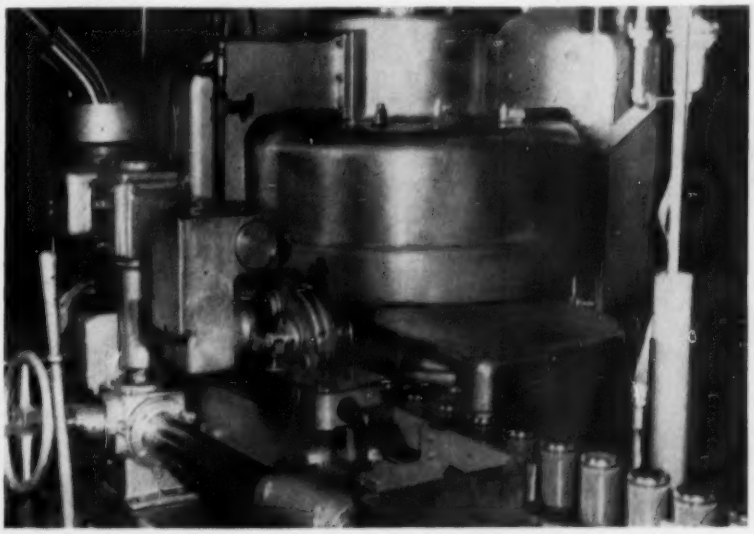
High capacity and efficiency, compactness, and low material holdup are advantages reported for a new centrifugal countercurrent solvent extractor.

Called Chemizon, its food applications include degumming of soybean and other oils, dual solvent fractionation using two extractors in series, and caustic and acid refining. Model shown above processes at 500 gpm. combined streams of systems having difficult mixing and separating characteristics. Other units handle up to 1,000 gpm. in a single machine.

Compactness of extractor and drive unit permits low initial cost, while installation requires only a simple concrete foundation. In applications handling 500 to 1,000 gpm., rotor material holdup is about 200 to 250 gal. Equilibrium is established quickly with a minimum of off-stream product.

Rotor (42 in. dia. x 42 in. wide) is constructed of type 316 stainless steel. Rotor cover is stainless and base is stainless-clad steel. Mechanical seals and heavy-duty roller bearings are lubricated by a forced-feed recirculating oil system to minimize maintenance. Balanced electronically, rotor operates quietly at full speed at 2,000 rpm.—*Podbielniak, Inc., 341 E. Ohio*

Circle 137C on Reader Service Card

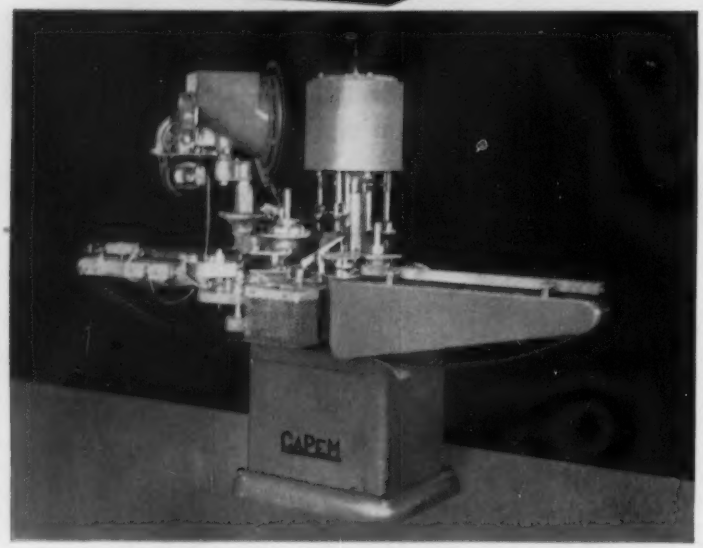


High-Speed Rotary Sealer Reduces Processing Time

At 700 per min., jars of baby food capped with new press-on vacuum closures (Vapak) leave recently developed rotary sealer. Speed of machine reportedly cuts time between peeling and final packaging to as little as 10 min. Modified units will handle different lid sizes to expand line to other products.—*Owens-Illinois Glass Co., Ohio Bank Bldg., Toledo 1, Ohio.*

Circle 137D on Reader Service Card

IF PACKAGING COSTS ARE
SKYROCKETING
CAPEM SCREW CAPPERS
WILL BRING THEM
DOWN



More CaPeM Automatic Screw Cappers are in use than any other make. And for very good reasons. They combine low initial cost, low operating cost and a minimum of maintenance expense.

MEET EVERY PACKAGING REQUIREMENT

Eight standard CaPeM models accommodate a broad range of standard sizes and shapes of both containers and caps, as well as a wide variety of flexible molded closures of the CT type, both in combination with polyethylene squeeze bottles and otherwise.

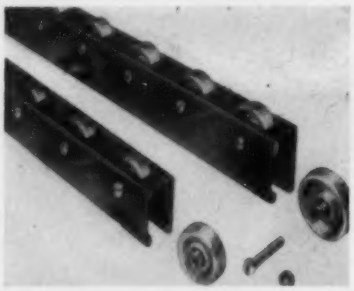
In addition, advanced types of CaPeM machines are adapted for sorting, feeding and applying Wheaton and similar type closures, Kimble-type polyethylene plugs, polyethylene fitments, corks, etc., and in combination with a wide variety of secondary closures.

CaPeM is fully automatic . . . delivers a uniformly dependable seal . . . handles bottles, cans, jars and jugs from 2 ozs. to gallons . . . applies all types of metal and plastic screw caps . . . is easily synchronized with all standard types of related equipment.

Write for specifications and the name of your nearest Consolidated representative. You'll find his broad experience with all types of packaging problems helpful.

CONSOLIDATED PACKAGING MACHINERY CORP.
1400 West Ave., Buffalo 13, N. Y.

Equipment & Supplies



Versatility and Strength Mark Strip Conveyors

Numerous materials-handing applications in production or warehousing operations are cited for a new-type lightweight gravity-wheel strip conveyor.

Called Flow Track, it is available in two standard sizes each with a choice of three wheel spacings. Unit can be used with other types of conveyors, may be mounted on stands, laid on the floor, or set on work benches. Items handled include packages, cases, cartons, pallets, and sheet stock.

A new method of wheel mounting gives two-point axle support designed for maximum resistance to bending under load. Hug lock nuts hold wheel assembly securely, and wheel bearings are permanently lubricated to reduce maintenance.

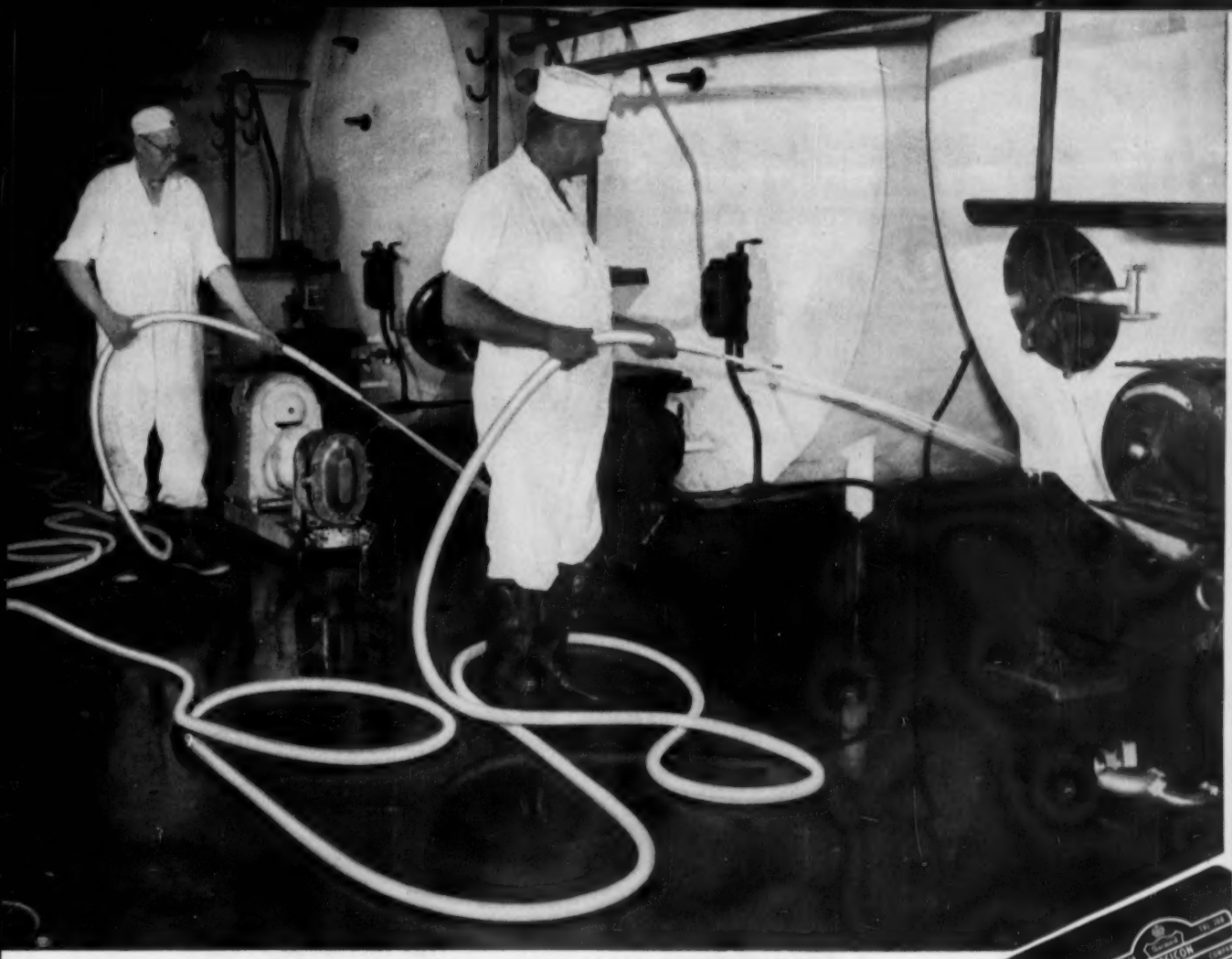
Standard 10-ft. section with supports on 5-ft. centers has a distributed load capacity of 400 to 750 lb. Its weight of 15-24 lb. permits easy setup and storage.—*Rapids-Standard Co., 342 Rapistan Bldg., Grand Rapids, Mich.*

Circle 138A on Reader Service Card

Sanitary Design Featured In 1-Piece Cleated Belt

Cleat and body of this new conveyor belt are one solid piece, thus there are no joints, cranks, or gaps.

Recommended for incline conveying of all types of products, its fabric-reinforced cleats can be made in any height, width, and spacing, and as stiff or flexible as desired. They can



Thermoid Hose designed specifically for use in food processing plants

Thermoid designs and manufactures many types of hose for a wide variety of specific industrial applications. These 3 are ideal for use in food and beverage plants:

VERSICON most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases.

CREAMERY for use with hot or cold water and low pressure steam, for cleaning and sterilizing.

BREWERS for use in breweries, wineries and food plants. Imparts no taste or odor.

Your Thermoid Distributor carries a full line of Thermoid Hose, Conveyor Belting and Multi-V Belts to meet your most exacting requirements. He maintains complete stocks and can give you fast service. If you prefer, write direct.

Thermoid

Conveyor & Elevator Belting • Transmission Belting
V-Belts • Wrapped & Molded Hose

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

THE SPOTLIGHT'S ON NEW IDEAS

at the

25th EXPOSITION OF CHEMICAL INDUSTRIES

COMMERCIAL MUSEUM
and CONVENTION HALL

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Dec. 5-9

If you're a chemist . . . chemical engineer . . . production man . . . executive—there's no better, no easier way for you to keep up with today's developments than by taking time out to visit this important exposition! Over 500 informative exhibits throw the spotlight on the new facts, ideas, materials and methods that you must have at your fingertips.

At no other exposition in the country can you see so complete a display of the newest materials, supplies and equipment to serve the chemical processing industries. Hundreds of experienced technical representatives at the stimulating exhibits will bring you up to date on the newest processing methods. *Just a single idea picked up at this year's great EXPOSITION can profit you over and over again!*

Arrange NOW to come—and to bring your key men—to this important EXPOSITION. Write today for free advance registration and hotel accommodation forms to

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480 Lexington Avenue, New York 17, N. Y.

be supplied in rubber, Neoprene, or special compounds for resisting grease, oil, and juices. Colors available are white, tan, or black.

From a sanitation viewpoint, absence of cracks or crevices prevents accumulation of bacteria, and smooth curves simplify cleaning. Furthermore, maintenance costs are cut since there are no rivets, bolts, or nuts to pull loose.—*A. J. Sparks Belting Co., 867 Grandville Ave., S. W., Grand Rapids, Mich.*

Circle 1388 on Reader Service Card

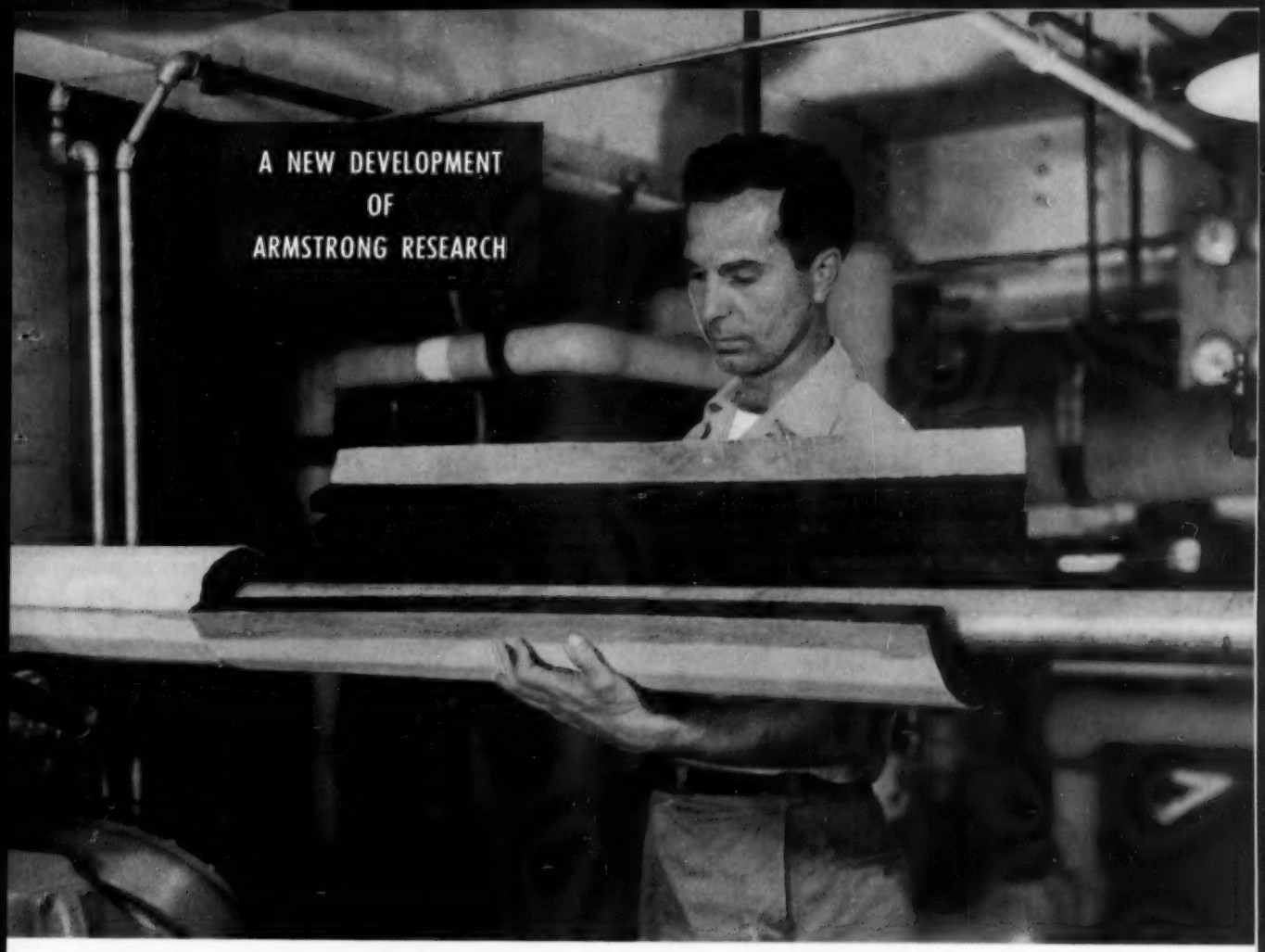
New Beta-Ray Generator Has Increased Power

This new electron-beam generator, for use in sterilizing foods, operates at 2,000,000v. and 1½ milliamp. to provide a trebled output of 2100w. and twice the penetrating power formerly available.

Electron beam sweeps back and forth across a rectangular field 8 in. wide to sterilize or treat several times more product in a given time. Unit is one of four types developed by maker. Others are: (1) A 2,000,000v. machine operating at ½ milliamp. and emitting a circular beam of 2½ in. dia., (2) a 1,000,000v. unit operating at 3 milliamp. with a rectangular beam 8 in. wide, and (3) a 1,000,000v. machine operating at 1 milliamp. with a 2½ in. dia. beam.

Whereas apparatus was formerly made available only on a rental basis, it is now being sold outright. Furthermore rates for purchase and rental have been revised to enable more economical use of equipment by smaller processors.

The generator emits electrons (beta rays) that prevent spoilage of foods, lengthen their storage life, and reduce amount of refrigeration needed to pre-



LT Cork Coverings . . . *low-cost, easy-to-apply insulations for low-temperature lines*

This complete new line of economical cork pipe covering is designed to prevent condensation on lines operating at temperatures to 30° below zero. Available in three types—LT-Thirty, LT-Zero, and LT-Minus Thirty—these coverings offer the same high insulating efficiencies and long life as molded cork coverings, yet cost much less for materials and installation.

LT Cork Coverings are fabricated from precision-cut sections of Armstrong Corkboard bonded to a fire-resistant, asbestos and aluminum foil jacket. The aluminum foil acts as a built-in vapor barrier. The white jacket presents a trim appearance that usually requires no further finishing.

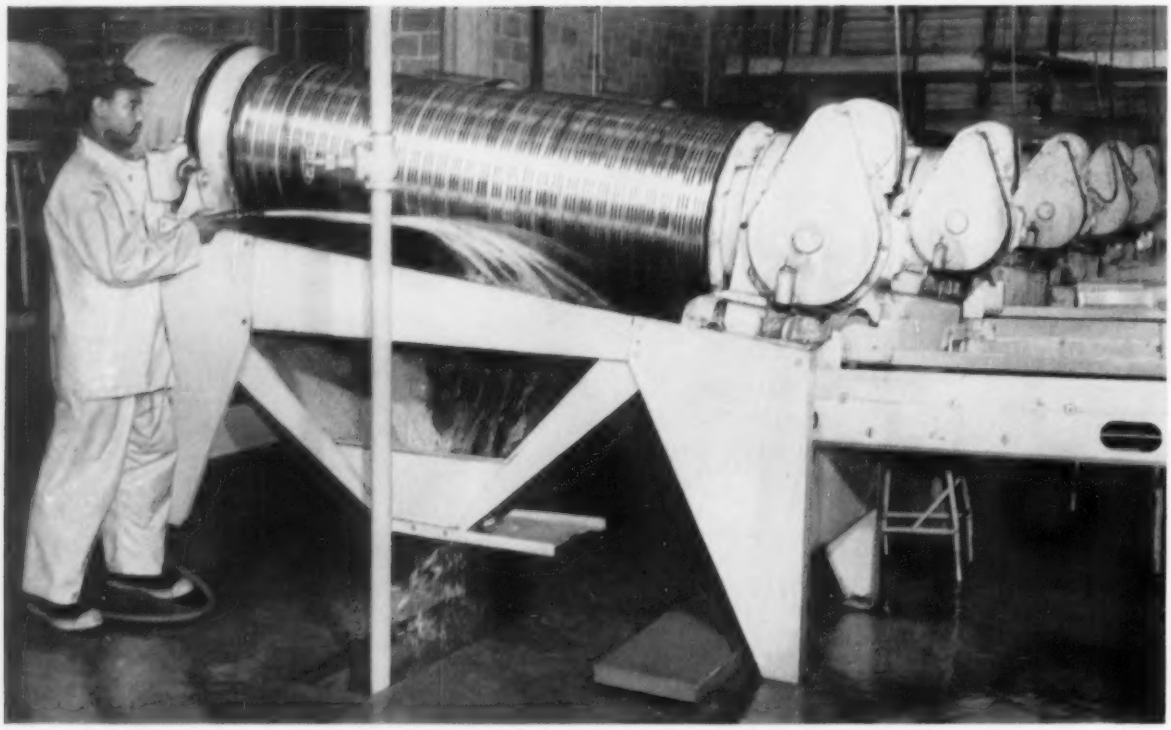
Installation of LT Cork Coverings is fast and easy. Simply apply Armstrong 520 Adhesive to a special overlap on the covering, fit the covering tightly around the pipe, and press the lap firmly in place. Butt joints are sealed quickly with a self-adhering white vapor-barrier tape.

The development of LT Cork Coverings is another example of how Armstrong continues to work to improve industrial insulation materials and methods. For descriptive booklets on the entire Armstrong line of industrial insulations and Complete Contract Service, call your nearest Armstrong office or write Armstrong Cork Company, 2010 Stratton St., Lancaster, Pa.

LT-Thirty Cork Covering prevents sweating under normal conditions at line temperatures of 30° F. or above. LT-Zero is suitable at temperatures down to 0° F.; LT-Minus Thirty at temperatures to −30° F.

Armstrong INDUSTRIAL INSULATIONS

FP *complete process instrumentation*



Cleaning vegetable processing equipment in the Bergen plant of Curtice Bros.

F&P Chlorinator Is Vital Link in Food Processing Plant Modernization Program

The Curtice Bros. Co., of Rochester, N.Y., one of the oldest canning firms in the country, undertook to modernize its Bergen, N.Y., plant. In 1954, this concern installed an F&P chlorinator to sterilize the well water used to wash food and equipment. Prior to the installation of the F&P unit, sodium hypochlorite had been mixed as a concentrated solution in a gallon jug and emptied into a large tank of water. This proved to be not only costly, but very undependable, for it was impossible to determine the exact chlorine content of the water. Furthermore, because of reliance solely on gravity pressure from the tank, much of the equipment never benefited from the chlorinated water sterilization.

Charles A. Stevenson, chief chemist at Curtice, originally specified the F&P chlorinator—capable of treating 600,000 gallons per day—because of its low installation cost. But it has proved to have many other advantages, such as ease of operation, economy, freedom from maintenance requirements.

Features of the F&P Model 1050-A Chlorinator

- Only corrosion resistant materials are used in its construction
- Cabinet made of plastic-impregnated Fiberglas* —never needs painting
- Simplicity of operation—internal piping in vacuum system employs "snap-in" type construction with "O" rings requiring no unions
- Designed for installation by unskilled labor

Fischer & Porter offers a wide variety of chlorinators for use in food processing industries, municipal water systems, industrial plants, and swimming pools. Consult your local F&P representative or write for free literature.

*Trade Mark OCF Corp.

FISCHER & PORTER COMPANY
COUNTY LINE ROAD • HATBORO 11, PA.

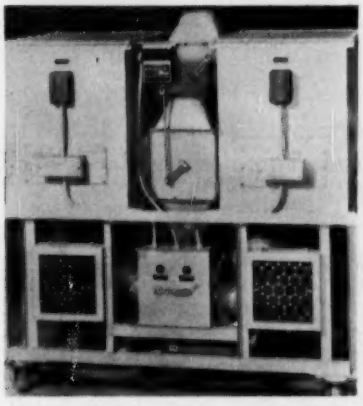
Measuring, recording and controlling instruments
Centralized control systems
Data reduction and automation systems
Chlorination equipment
Industrial glass products

Sales offices in 32 American cities and in principal cities abroad

serve them. Unit has been used to kill grain-storage insects or make them sterile at a cost of about 1½ c. per ton for electric current. Besides controlling insects, scientists believe treatment can prevent mold on wheat to permit storage at a higher moisture content, and that machine may be practical for use by elevators.

Shelf life of beans can be increased by this treatment, and bread may be kept at room temperature for many months without molding. Also proposed is unit's application to sugar beets to increase yield of sugar, to milk and other dairy products for pasteurization, and on potatoes to prevent sprouting.—*X-Ray Dept., General Electric Co., 4855 Electric Ave., Milwaukee 1.*

Circle 140A on Reader Service Card



Large Areas Dehumidified By Adsorption-Type Unit

Humidities as low as 10% over a wide range of temperatures may be maintained in areas up to 60,000 cu. ft. with use of this adsorption-type dehumidifier. Suggested applications are in candy plants, dairies, and refrigerated warehouses.

Heavy-duty unit (Dryomatic T-150) is an automatically regulated dual-tower device that uses silica gel as drying agent. Machine has a dry air output of 150 cfm and removes 4 to 5 lb. of water per hr. Regeneration of silica gel is accomplished automatically by electric heating elements.

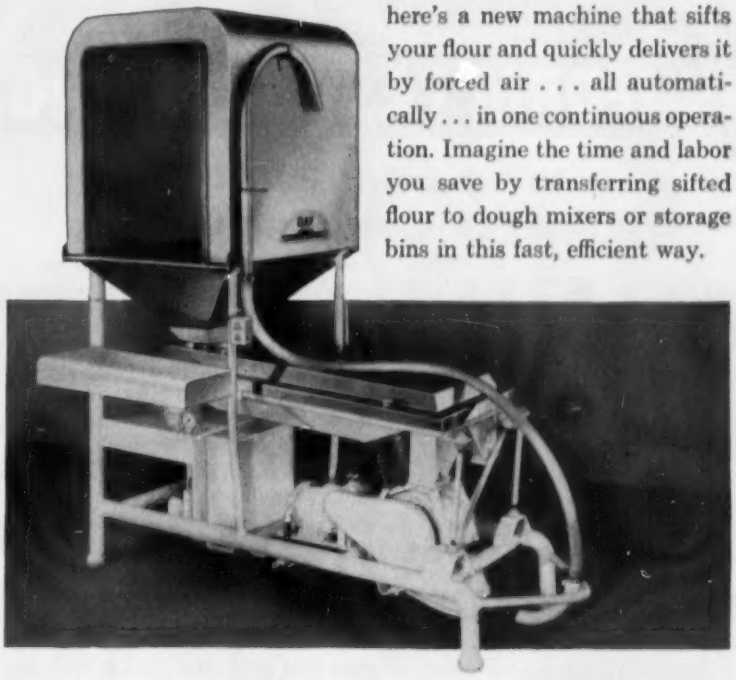
Unit employs a motor-operated four-way valve that alternately directs air from one tower to the other. As one tower is regenerated, other continues to dehumidify to provide constant flow of dry air. Furthermore, thermostats control regeneration cycle and make equipment self-adjusting to atmospheric conditions.

Only standard electrical outlets and a minimum of duct work are required.

operation "airmatic" with the

DAY RO-BALL AIRMATIC...

here's a new machine that sifts your flour and quickly delivers it by forced air . . . all automatically . . . in one continuous operation. Imagine the time and labor you save by transferring sifted flour to dough mixers or storage bins in this fast, efficient way.



Flour is sifted in the popular Ro-Ball Sifter (one component of the Ro-Ball Airmatic) and is then blown to another point by a low-pressure air system, which requires only 4-12 psi and 10 cfm to convey 100 pounds of flour per minute. No objectionable dusting. Low air consumption permits use of your existing air lines. Sanitary construction throughout. For complete information write for Specification Sheet B-105RA.

FOUNDED 1887

in baking equipment **DAY** *means longer life span*

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INCORPORATED
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Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
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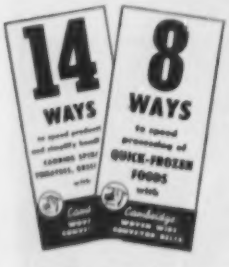
For more information, use coupon on last page.

UNIFORM FAST FREEZING

WITH *Cambridge*

WIRE MESH CONVEYOR BELTS



Regardless of what you're freezing, you'll get a more uniform product by washing, blanching, cooling and freezing at controlled speed on continuously moving wire mesh belts. Open mesh permits free circulation of steam for uniform blanching and cold air for faster freezing, provides rapid drainage of wash water and steam condensate. Write for these detailed discussions of how Cambridge Wire Mesh Conveyor Belts can speed production by minimizing manual handling.

No matter what food or process . . .

. . . canning, freezing, baking . . . meat, poultry, candy, fruit or produce . . . Cambridge Wire Mesh Conveyor Belts can reduce your operating costs and increase product quality by continuous uniform processing with reduced manual handling. Lifelong rust-protection, quick drainage of process solutions, lack of odor and freedom from contamination are only a few advantages. All-metal belt is impervious to damage from heat and cold. There are no sharp edges because Cambridge belts are woven from round wire.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, and from any metal or alloy. Special raised edges or cross-mounted flights are available to hold your product during movement.

Call in your Cambridge Field Engineer to discuss how you can cut food processing costs by continuous operation. You can rely on his advice. Write direct or look under "BELTING, Mechanical" in your classified telephone book.

ASK FOR FREE 130-PAGE REFERENCE MANUAL illustrating and describing wire mesh conveyor belts. Gives mesh specifications, design information and metallurgical data. Ask for Special Industry Folder on your operation.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

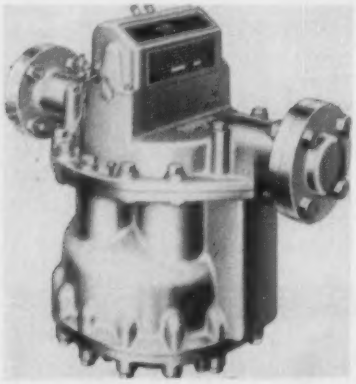
DEPARTMENT Q, CAMBRIDGE 10, MARYLAND

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Equipment & Supplies

Machine is compact and can be mounted on casters for easy relocation. Built-in or remote humidistat control may also be provided for automatic on-off operation. Unit's dimensions are 51 x 28 x 44 in., weight is about 400 lb.—*Dryomatic Corp., 812 N. Fairfax St., Alexandria, Va.*

Circle 143A on Reader Service Card



Approved Meter Guards Beer Taste and Color

A new beer meter, made of bronze with stainless steel and hard-carbon working parts, is said to be unaffected by fermented liquids—thus does not change taste or color of metered product.

Called Fig. 486, the 215-bbl./hr. meter is approved by the Alcohol Tax Unit and has working pressure of 125 lbs. Its locked continuous-recorder counter registers to 999,999 bbl. and repeats. A setback counter records to 9,999 bbl., with ½- and 1/80-bbl. wheels including 50 graduations of 1/400 bbl. on the ½-bbl. wheel.

Unit has double lens with air space to prevent frosting, and is furnished in 2-in. flanged connections for gravity or pressure flow.—*Bowser, Inc., Ft. Wayne, Ind.*

Circle 144A on Reader Service Card

OTHER DEPARTMENTS
Featured in This Issue

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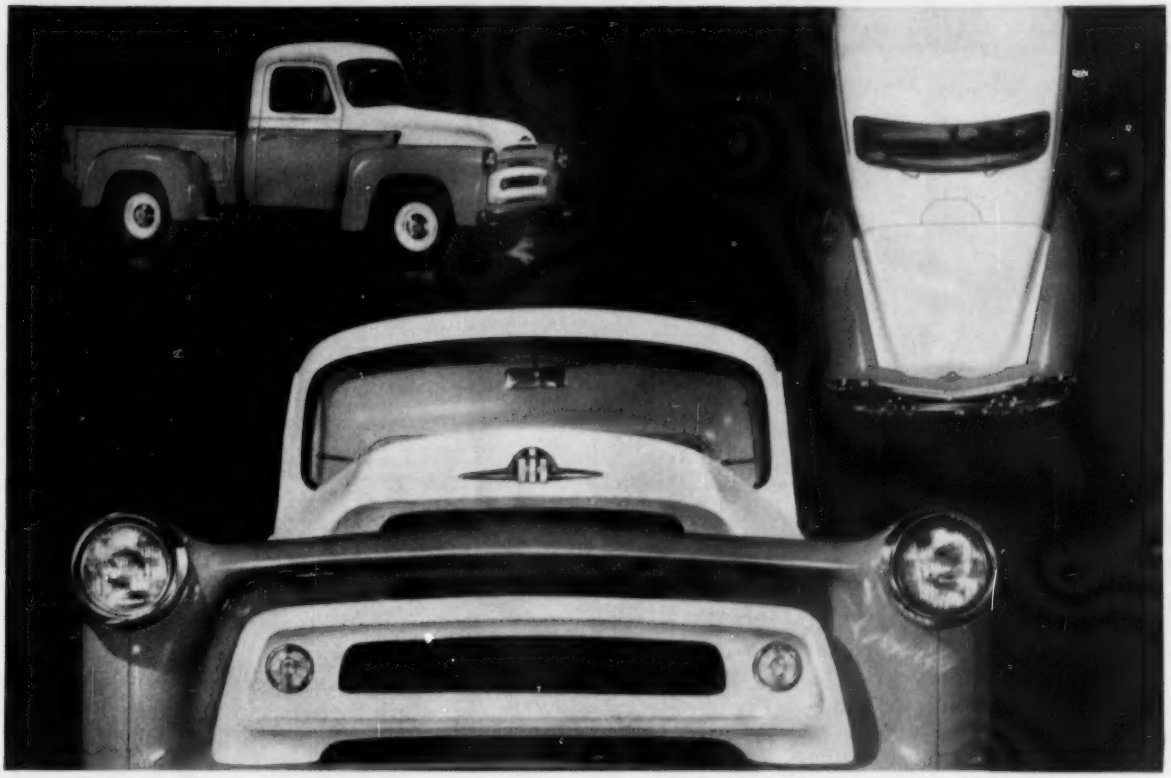
new style! new comfort! new power!

new Internationals!



New INTERNATIONAL "S-line" includes light, medium and heavy-duty models from 4,200 to 33,000 lbs. GVW, with 10 gasoline and LPG engines, every modern truck feature.

Functionally styled for practical good looks!

Here are the new INTERNATIONALS . . . a great new truck line from *any* point of view! Their clean-lined styling is trim and functional — designed to take the rough going of truck work without excessive repair costs.

Driver designed for real comfort!

They give you real comfort, too! They're driver-designed to let you work longer without fatigue. Loaded with performance and handling features that make hauling jobs easier.

More usable horsepower for BIG money savings!

These great INTERNATIONAL trucks offer more horsepower — develop their power for sustained operation at lower, more economical engine speeds. They're *all truck* with no passenger car engines or components asked to do a truck job. That saves you the BIG money — the over-the-years operating and maintenance money. Drive them today, at your INTERNATIONAL Dealer or Branch.

You relax in REAL comfort in Comfo-Vision cabs. Comfort-angled steering wheel. Low hood for closer view ahead. "Quiet-ride" roof lining, draft-free doors. Choice of 24 solid and optional two-tone exteriors. Optional deluxe cabs have color-keyed interior, chrome trim.

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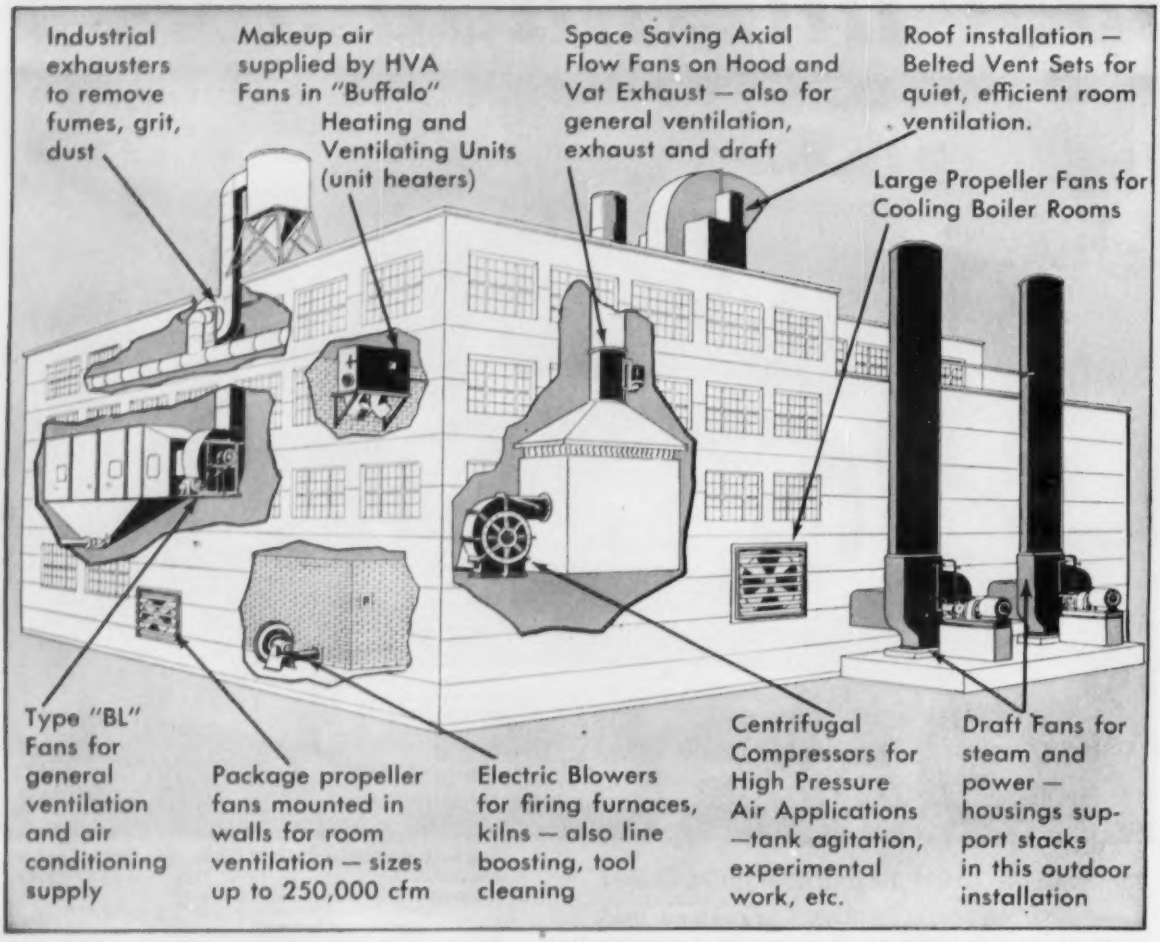
INTERNATIONAL® TRUCKS

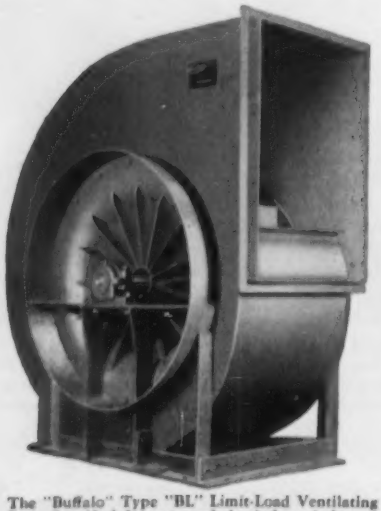
All-Truck Built to save you the BIG money!

International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors . . . Motor Trucks Industrial Power . . . Refrigerators and Freezers

For more information, use coupon on last page.

AIR . . . BREATH-OF-LIFE FOR THE PLANT!


Industrial exhausters to remove fumes, grit, dust
Makeup air supplied by HVA Fans in "Buffalo" Heating and Ventilating Units (unit heaters)
Space Saving Axial Flow Fans on Hood and Vat Exhaust — also for general ventilation, exhaust and draft
Roof installation — Belted Vent Sets for quiet, efficient room ventilation.
Large Propeller Fans for Cooling Boiler Rooms
Type "BL" Fans for general ventilation and air conditioning supply
Package propeller fans mounted in walls for room ventilation — sizes up to 250,000 cfm
Electric Blowers for firing furnaces, kilns — also line boosting, tool cleaning
Centrifugal Compressors for High Pressure Air Applications —tank agitation, experimental work, etc.
Draft Fans for steam and power — housings support stacks in this outdoor installation



The "Buffalo" Type "BL" Limit-Load Ventilating Fan. Specified for many of the industry's largest ventilating and air conditioning jobs, it is the finest fan we have ever offered. Available in closely graduated capacities from 1000 cfm to 500,000 cfm. Write for Bulletin F-100 for full details.

. . . supplied EFFICIENTLY by "Buffalo" FANS

INDUSTRY'S CHOICE FOR 78 YEARS

Whatever your product, air goes into it! The air that makes workers more alert and productive — the air that gives you efficient combustion — the air that's used to remove undesirable substances — the air you warm with or cool with — is your plant's breath-of-life.

Above are just a few of the ways in which "Buffalo" Fans help a plant to breathe. There's a fan in this complete line for any job you may have for air. And it's well to remember that all makes of fans are *not* alike. There's a great deal to the science of making a fan that will give you permanently good performance. From our 78 years, we know what's practical and what isn't — what must go into a fan. We call it the "Q" Factor* — the "extra" that makes the user glad he specified "Buffalo".

**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

"Buffalo"

BUFFALO FORGE COMPANY

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Publishers of "FAN ENGINEERING" Handbook

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Sales Representatives in all Principal Cities

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

Wet-Dry Vacuum Cleaner Eases Plant Sanitation

Simplified floor maintenance is reported with use of a new wet-dry industrial vacuum cleaner.

Called Vacmobile, it offers large non-marking rubber wheels and handle bar for convenient carry. Machine glides over carpet edges and sills, climbs ramps and stairs without lifting, and rolls between desks, furniture, or aisles. Unit is powered by 1¼ hp. motor designed with a safety by-pass for picking up water and detergents. Recovery capacity is 12 gal. or 1½ bu.

Also available with cleaner is a ball-bearing accessory (Master Tool) equipped with slide-on adapters, such as a squeegee.—*West Disinfecting Co., 42-16 West St., Long Island City, N. Y.*

Circle 147A on Reader Service Card

Novel Inorganic Coating 'Cold Galvanizes' Steel

Plant maintenance painters reportedly can give steel structures the same protection that galvanizing affords, plus salt-water resistance, with use of a new protective coating called Dimetcote.

Although not a paint, it is applied with either brush or spray. Substance is an inorganic, metallic zinc coating that contains no oils or resins. Only one coat is said to be required for most applications.

In addition to weather and abrasion resistance, material is unaffected by solvents and petroleum products. Moreover, the film is said to cathodically

It Pays To Take a
Plant-Wide Look
at Weighing!

A Modern Weighing System
Makes the Big Cost-Control Difference

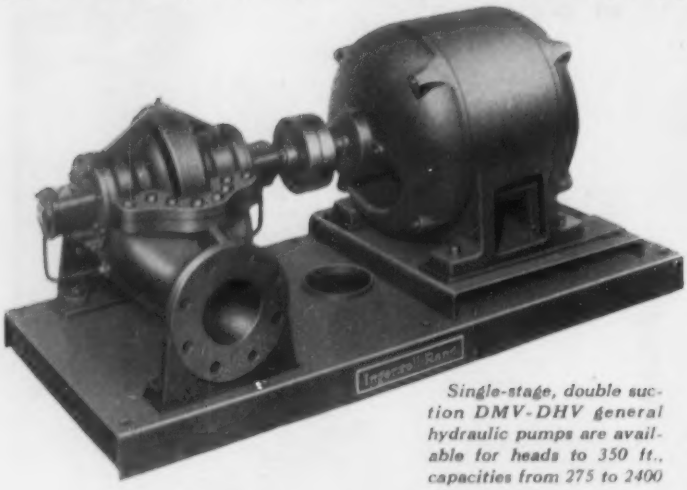
Today it's more than ever important to think of weighing not in terms of isolated scales, but as a vital part of your overall quality-control and cost-control system. This means the right scales in the right places . . . to provide basic accounting records of materials received, processed, shipped or transferred. Weight records that originate at scales directly affect costs, inventories and customer billings. Weighing errors cannot be corrected later—weights must be right the *first* time. That's why it's so important to have a modern weighing *system* for top efficiency in your plant operations.

May we tell you more about the "weighing system plan"—and its application to your requirements? Write to . . . Toledo Scale Company, Toledo 1, Ohio.

For more information, use coupon on last page.

HERE'S EXTRA PROTECTION

against pump shaft leakage



Single-stage, double suction DMV-DHV general hydraulic pumps are available for heads to 350 ft., capacities from 275 to 2400 gpm.

Use of double mechanical shaft seals in

DMV-DHV PUMP LINE

ends stuffing box maintenance

This modern DMV-DHV pump *is different!* Gone are the conventional packed stuffing boxes—with their periodic tightening, repacking, and annoying shaft leakage.

Double Mechanical Shaft Seals are standard equipment. Self-adjusting, they require no attention throughout their entire service life. Leakage is effectively prevented.

NO BEARING LUBRICATION

Another advanced design feature of the DMV-DHV pump that helps eliminate maintenance problems is the use of Cartridge-Type Bearings. The lubricant is permanently sealed in. This means successful operation for many years —in tough installations—without any servicing.

Greater Compactness is obtained with this modern construction using mechanical shaft seals and sealed bearings.

Contact your nearest I-R branch office for full details. Or write for Bulletin 7248-A.

Ingersoll-Rand

10-289 Cameron Pump Division

11 Broadway, New York 4, N. Y.

PUMPS • CONDENSERS • TURBO-BLOWERS • COMPRESSORS • ROCK DRILLS

DIESEL & GAS ENGINES • AIR & ELECTRIC TOOLS

Equipment & Supplies

inhibit corrosion of contiguous areas of bare steel by a surface reaction that produces chemical bonding as well as physical adhesion.—*Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.*

Circle 147B on Reader Service Card

Compact Leak Detector Has High Sensitivity

This instrument operates to give audible and visual warning of leaks in systems using high vacuum, pressure, or hermetic seals.

Employing a radio-frequency mass spectrometer principle, detector has been redesigned for compactness and offers a sensitivity of one part in 700,000. Plug-in chassis reportedly simplifies maintenance and eliminates downtime.—*Beckman Div., Beckman Instruments, Inc., Fullerton 1, Calif.*

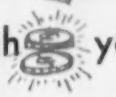
Circle 148A on Reader Service Card

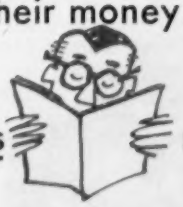
Vibration, Shock Reduced By Heavy-Duty Mounting

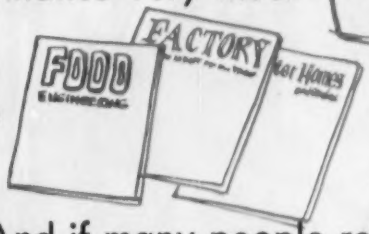
For improved shock and vibration control, this heavy-duty mounting combines effectiveness of steel springs with novel damping, sway, and thrust-control elements.

As every schoolboy knows, almost all magazines

make their money from ads.

The dough  you

readers  shell out doesn't finance very much but is

it important! It means the magazine 

has got to

be so good you want it.

And if many people refuse

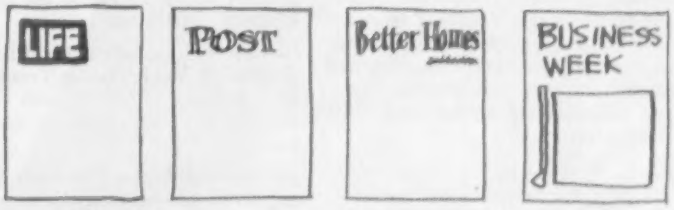
to pay for it, the editor had better fix it—or else . . .

That's why you've got to pay for your favorite

magazines.

Keeps the editor on his toes. Tells the advertiser

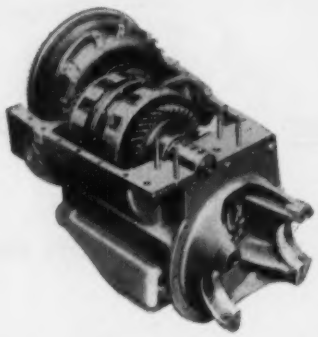
what people really read. And helps you pick out the magazines that

have got to be worthwhile! 

Food Engineering . . . 28,000 paid circulation . . . for 25 years a member of

The Audit Bureau of Circulations

The smoothest handling lift truck ever built



YALE *Torque Transmission*
[FULLY AUTOMATIC]

Specifically designed for the KGA51 Series of Yale Industrial Lift Trucks, the Yale Torque Transmission through torque conversion provides the best all-purpose means of attaining "POWER WHEN NEEDED."

YALE KGA 51 SERIES

Ease and safety of a modern car . . . automatic response to power demand

with YALE *Torque Transmission*

[FULLY AUTOMATIC]

Automatic Power Control. Engineered exclusively for the KGA51 series, the YALE Torque Transmission matches power to power demand . . . applies the necessary power at the moment it's needed for starting or climbing grades under all load conditions.

Fully Automatic Transmission. Simplified controls increase operator efficiency, reduce fatigue. No clutch pedal or shifting of gears. Only two drive controls—accelerator and directional control lever.

Inching Control. Smoother and more accurate maneuvering of the truck is permitted at times when high engine speeds are required to perform faster lifting or for an attachment operation.

Longer Truck Life. "Cushioned Action" of YALE Torque Transmission reduces vibration and shock loading with less wear on moving parts.

Increased Operator Efficiency. Lowered cowl affords maximum visibility with operator protection. Improved safety and comfort offered by lowered seat.

Versatility. Available in capacities from 3000 to 8000 lbs. . . . Gas, Diesel, or LP-Gas powered . . . cushioned or pneumatic tires.

Gas, Electric, Diesel, LP-Gas Industrial Lift Trucks • Worksavers
Warehousers • Hand Lift Trucks • Hand and Electric Hoists

FREE, FACT-FILLED BOOKLET

This informative color booklet includes cut-away of the KGA51 Truck—shows why this is the smoothest handling lift truck ever built. Write: The Yale & Towne Manufacturing Company, Roosevelt Boulevard, Philadelphia 15, Pa., Dept. 4610.

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*REG. U. S. PAT. OFF.

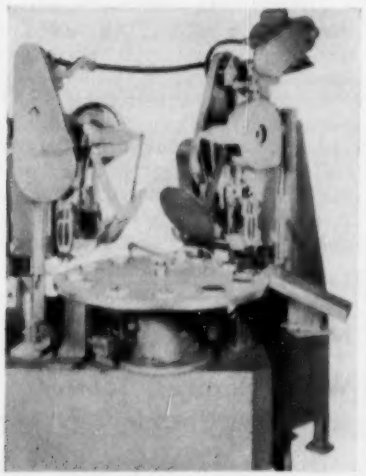
Called Finnflex Type 2B, units are available in 41 standard sizes ranging in capacities from 100 to 6,500 lb. They consist of cast semi-steel housings containing helical steel springs, rubber thrust bumpers, nylon dampers, and a steel baseplate with sway-control assemblies. A dual-purpose bolt secures mounting to machine and also provides for easy leveling.

Nylon-lined, pre-compressed cylindrical rubber bumpers absorb thrust in any horizontal direction. Liners protect rubber from abrasion, thus offer constant stiffness. Because of low-friction characteristics of nylon, high thrust control is obtained with minimum increase in vertical stiffness.

Damping is also provided by liners which, provided with wear compensating gaps, are pressed snugly around steel studs by thrust bumpers. All wear is taken up and proper adjustment is maintained automatically. Furthermore, adjustable sway-control assembly provides stability without external snubbing devices. Proper degree of sway-control may be set by simple adjustment of self-locking nuts.

Units are available with rubber-bottomed, non-walking baseplates that eliminate need for lagging of mountings to floor.—*C. R. Finn & Co., Industrial Div., Hawthorne, N. J.*

Circle 1488 on Reader Service Card



Efficient Two-Color Unit Prints on Plastic Lids

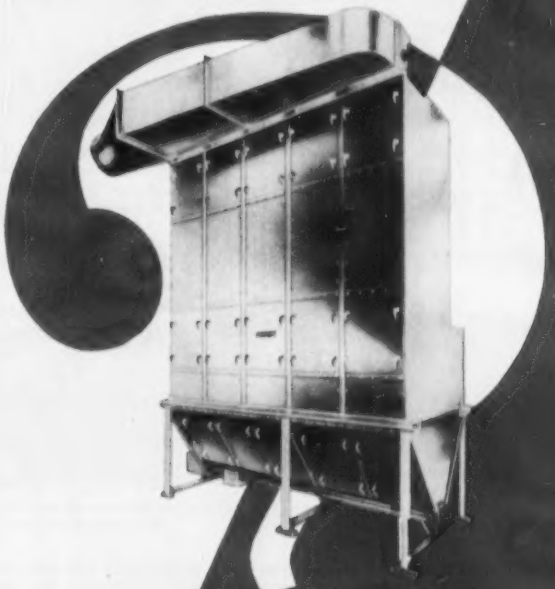
Speed, economy, and imprint legibility are reported advantages of a new machine that permits two-color markings on printable polyethylene and styrene lids, caps, and covers. Operating rate varies up to 45 imprints per minute.

With this unit (25AD2 Markem),

"DO-IT-YOURSELF" or "TURN-KEY" job ? ? ?

an ENTOLETER DIVISION designed system solves dust collection problems either way . . .

Our engineering staff will specify the Simon Suction Filter Dust Collector to meet your requirements. . . . . ship you the parts and installation instructions and you can "DO-IT-YOURSELF"! All parts are jig-drilled and tapped to facilitate assembly . . . or dismantling should future requirements dictate its relocation.



OR. . .

Our engineering staff will design a "turn-key" dust collecting system incorporating a Simon Suction Filter Dust Collector, tailored to your specific requirements . . . contract and supervise its complete installation . . . relieving you of all details until it's time to pull the "ON" switch.

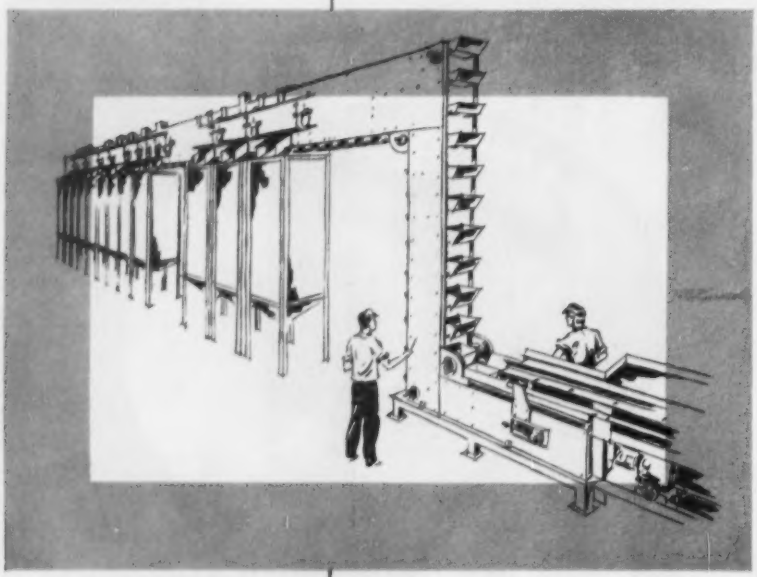
Regardless of which method solves your dust collecting problem . . . the all aluminum SIMON SUCTION FILTER DUST COLLECTOR is the answer. It has been redesigned and streamlined to keep in step with modern food processing . . . contains greatest filtering area per square foot of floor space . . . operates with high air to cloth ratios . . . uniform air flow . . . low power requirements . . . IT IS YOUR BEST BUY IN DUST COLLECTING EQUIPMENT!

ENTOLETER DIVISION
The Safety Car Heating & Lighting Company, Inc.
1187 Dixwell Ave., New Haven 4, Connecticut

For more information, use coupon on last page.

BETTER HANDLING IDEAS BY THE BUCKETFUL!

WHETHER THE PRODUCT IS STEEL BALLS OR NUTMEATS . . . DOOR LOCKS OR MARSHMALLOWS . . . PLASTIC PARTS OR CAKE MIXES . . . CONTINUOUS FLOW CAN BE ACHIEVED IN ROBO-LIFT BUCKET ELEVATING CONVEYOR SYSTEMS.



Material handling in the manufacture of door locks calls for complete flexibility and advanced control systems. Distribution of parts to as many as 38 storage bins is accomplished by one ROBO-LIFT with an unusually high degree of practical efficiency.

Counsel is equipped with a wealth of field experience analyzing continuous flow problems. Our engineering staff is available at all times to help in planning and completing your material handling project. They serve you best from the very outset of your planning.

Write to us now for further information.

Counsel MACHINE COMPANY, INC.
8 HATHAWAY STREET, WALLINGTON, N.J.

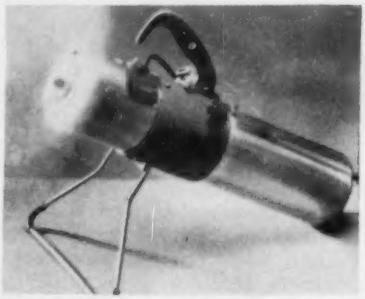
Mid-West Office: 333 N. Michigan Ave., Chicago 1, Illinois.

Equipment & Supplies

processors can print complete label details in one color, plus their own trademark or decorative design in a second color. Machine is easily adjusted for printing pressure, and height and thickness of items marked. Printing elements can be quickly changed and marking compounds are available in numerous colors.

Unit offers easily adapted or changed work-holding fixtures and 12-station dial feed synchronized with printing head for uniform color registration. Its design readily permits automatic feeding, and controlled ejection is optionally available.—*Markem Machine Co., Keene 51, N. H.*

Circle 151A on Reader Service Card



Insecticide Fogging Unit Blankets Wide Area

Efficient insect control is offered by a fog generator that covers a 64,000-sq.-ft. area with micron-size insecticide particles in 15 min.

Equipped with detachable stand, portable unit (Microsol) weighs 9 lb. and employs a 19,000-rpm. built-in fan. Latter sucks any type of liquid insecticide from leak-proof tank to produce the fog.—*Silver Creek Precision Corp., Silver Creek, N. Y.*

Circle 152A on Reader Service Card

New Chemicals

Water Hardness Spotted In 1-Min. Chemical Test

Hardness of water delivered by industrial softeners may be measured to the nearest 0.2 gr. per gal. with use of a pocket-size chemical kit. On-the-spot test, taking only 1 min., can be made by non-technical personnel to determine when softeners need regeneration.

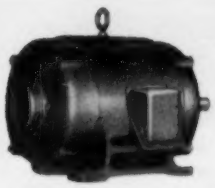
Contained in a white plastic box, the 3-oz. kit (Zeo-Kit) consists of a glass vial and dropper bottle that holds 1 oz. of softener reagent, sufficient to make 140 tests on water averaging

for full operating efficiency

choose a Century MOTOR

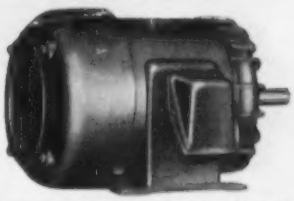
***Performance-Rated* to Bring Out All the Top Performance That's Engineered Into Your Equipment**

DRIP PROOF—1/20 to 3/4 H.P.
A.C., Single or Polyphase
Send for Bulletin 1-5P1



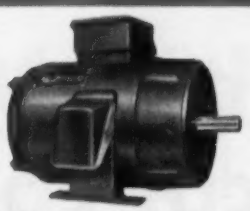
RIGID BASE, OPEN TYPE, PROTECTED
1 to 400 H.P.—A.C., Single or Polyphase
May be used in place of splash proof... screens available for rodent protection.
Send for Bulletin 6-1P1

CUSHION BASE, OPEN TYPE, PROTECTED—1/20 to 5 H.P.
A.C., Single or Polyphase
Send for Bulletin 6-1P1

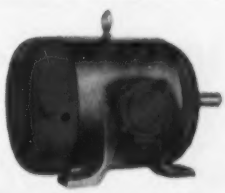


TtotALLY ENCLOSED FAN COOLED
1 to 100 H.P., A.C., Single or Polyphase
Send for Bulletin 6-1P1

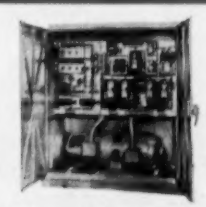
FLANGE BRACKET (NEMA "D")
Round, short frame—for horizontal or vertical operation
Send for Bulletin 6-1P1



FACE TYPE BRACKET (NEMA "C")
With feet for motor-mounted equipment
Send for Bulletin 6-1P1



EXPLOSION PROOF MOTORS
2 to 100 H.P.
UL approval Class I, "C" and "D"
Class II, "E," "F" and "G"
Send for Bulletin 6-1P45

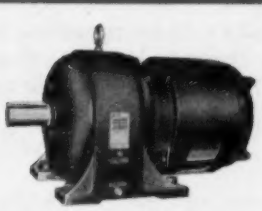


SELECTIVE SPEED DRIVES
1 to 150 H.P.
Offering a Wide Range of Closely Controlled Speeds
Send for Bulletin 11-1P1

Century Performance-Rating means that you can select precisely the right motor size, speed, frame, mounting and torque characteristics to fit the needs of each installation.

Performance-Rated© MOTORS
⅛ to 400 H. P.

Mail this coupon for FREE bulletins



GEAR MOTORS—1 to 125 H.P. (parallel)
⅛ to 3 H.P. (right angle or parallel)
A.C. or D.C., Speed to fit your need
Send for Bulletin 4-1P31

CENTURY ELECTRIC COMPANY

1806 Pine St., St. Louis 3, Mo. • *Offices and Stock Points in Principal Cities*

To CENTURY ELECTRIC COMPANY, 1806 Pine Street, St. Louis 3, Mo.
Please send me the following bulletins:

(fill in numbers here) .....

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Name ..... *Title* .....

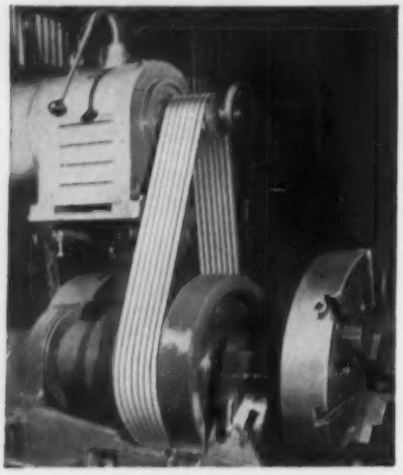
Company .....

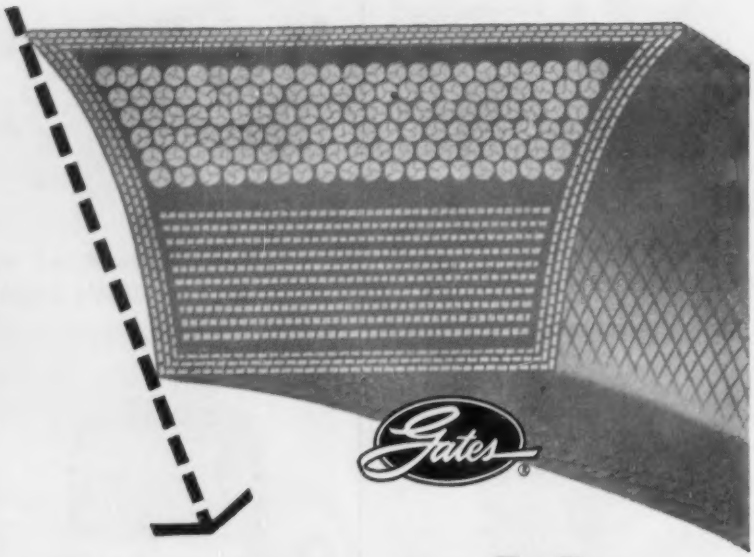
Address .....

City ..... *Zone* ..... *State* CE-37

For more information, use coupon on last page.

This large lathe was formerly driven by a flat belt which slipped on heavy cuts, stalled and broke tool bits. Savings on broken tool bits alone offset the cost of the drive the first year—and production was increased 25% after the V-belt drive was installed.





concave sides lengthen V-belt life ...cut costs

Hundreds of plants that keep track of V-belt drive costs know this: Gates Vulco Ropes . . . the V-belts with *concave sides*...wear much longer and *cost less per year of service.*

Here is the interesting reason why:

When a Gates V-belt bends around the sheave, the *precisely-engineered* concave sides (Fig. 1) fill out and become straight. Thus the sides of the belt make full, uniform contact with the pulley (Fig 1-A).

Naturally, uniform contact distributes the wear *evenly.* And *even* wear means *longer* wear.

Longer wear saves not only on replacement costs; it also saves the cost of down-time... keeps equipment producing.

Simple test proves value of concave sides

Take a straight-sided V-belt (Fig. 2) and bend it. Feel the sidewalls of the belt bulge out as the belt bends. You see immediately that the bulging sides prevent uniform contact with the pulley (Fig. 2-A). Uneven contact causes faster wear...increases your drive replacement costs.

Let the cost-saving longer life of Gates Vulco Ropes contribute to *your* profits. Specify Gates Vulco Ropes—the V-belts with concave sides (U.S. Patent 1813698). The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

YPA-54A

GATES VULCO ROPE DRIVES

0.5 gr. per gal. When reagent is added, water sample first turns red, then blue. Number of drops needed to turn sample blue determines hardness.—*Calgon, Inc., 323 Fourth Ave., Pittsburgh.*

Circle 152B on Reader Service Card

New Vanilla Flavorings Have Wide Application

Of interest to processors of ice cream, powdered desserts and milk drinks, chocolate coatings, and cake mixes are two new vanilla flavors.

First is a powdered product (Butrnilla) with a buttery note. Although developed for use in ice cream (8 oz. to 80 gal.), it is equally applicable to powdered milk drinks, desserts, and cake mixes.

Second material (Micronilla Vanrich) is made by grinding vanilla beans to microscopic particles, then adding aromatics to enhance odor and taste. Flavor of bean is protected by using a cold process that requires no solvent extraction.—*Dodge & Olcott, Inc., 180 Varick St., New York City 14.*

Circle 155A on Reader Service Card

Briefs . . .

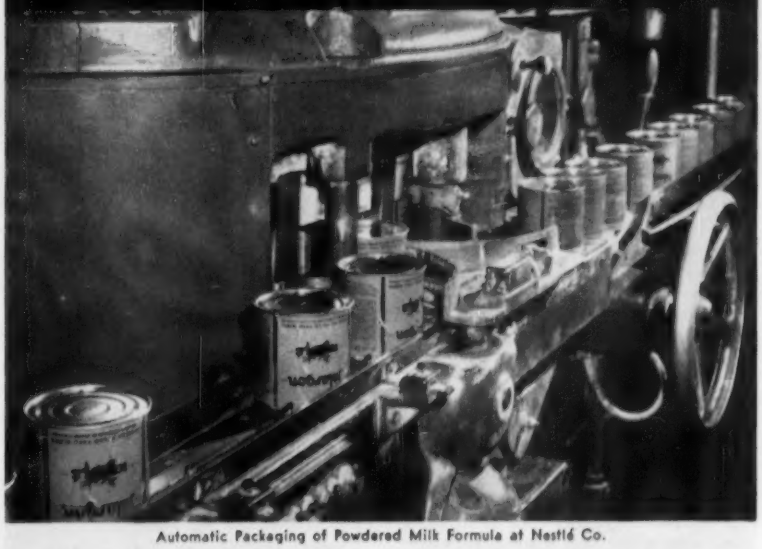
Automatic Milk Filler (four-valve), incorporating automatic carton infeed-outfeed conveyor, is designed to increase production, ease operation on all sizes of Canco or Sealking containers.—*Triangle Package Machinery Co., 6633 W. Diversey Ave., Chicago 35.* (155B)

Pre-Punched Conveyor Frame with variable roller spacing provides flexibility, economy by enabling repositioning of rollers to meet changes in product or container shapes. Available in all roller sizes, 11 frame sizes.—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* (155C)

Cutting Board for packing house use is made of resin-impregnated, densified birch to resist uptake of juice or odor. Lengths up to 6 ft.—*Chem-Wood Products, Harbor Island, Wash.* (155D)

Electric Fork Truck uses removable counterweight to provide two capacities—2,000 lb. for operating in and out of truck bodies, and 4,000 lb. for miscellaneous heavy freight.—*Lewis-Sheppard Products, Inc., Watertown, Mass.* (155E)

TO KEEP BABY FOODS FRESHER NESTLÉ PACKAGES UNDER GAS



Automatic Packaging of Powdered Milk Formula at Nestlé Co.

Producing Their Own Gas Through a GAS ATMOSPHERES' GENERATOR

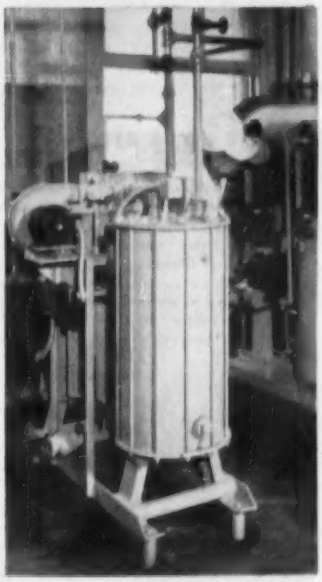
Costs Dropped From $9.60 to 15¢ per Day

Modern methods employed by the Marysville, Ohio, plant of The Nestlé Company, Inc., in packaging powdered milk formula for infant feeding call for the removal of all air, replacing it with an inert gas that prevents oxygen from coming into contact with the food. This is a practice that is rapidly gaining in popularity with the nation's leading food packers.

Nestlé's daily requirement of gas is about 1400 cubic feet. If purchased in cylinder form, this would cost approximately $9.60, plus the labor required for handling. By manufacturing their own gas, this amount costs a mere 15 cents. Figuring 320 working days in the year, the savings amounts to more than $3,000 annually—or enough to purchase generator equipment.

Nestlé has tried other generators, but prefers the Gas Atmospheres' because it gives them maximum production of highest purity gas at low operating costs.

Let Gas Atmospheres' engineers show you how you can produce your own gas at tremendous savings. Simply set down your requirements and they will estimate your equipment needs and give you a cost breakdown at no obligation.



Gas Atmospheres' Generator Used by Nestlé to Manufacture Inert Gas.

gas Atmospheres, inc

equipment for producing industrial gases

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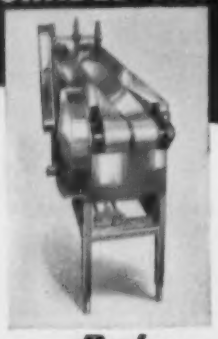
For more information, use coupon on last page.

Perfect HALVES FROM GRADED OR UNGRADED STOCK



NEW *Robins* UNIVERSAL HALVING MACHINE

For pickles . . . peppers . . . oranges . . . grapefruit . . . apples . . . cherries

You can cut grading time to almost nothing when you have a Robins Universal Halver. New trough-feed design automatically aligns stock of varying size. Simple change of one, easily accessible, finger type aligner permits change of production run within a few minutes.

Stainless steel contact parts and Neoprene belting assure perfect sanitation and easy cleaning. Can be fed by hand or by Robins Speedmatic Feeder.

WRITE FOR DATA SHEET...
gives operating data, specifications

Robins offers a complete line of "advanced feature" food processing equipment designed to speed production, raise quality and cut costs in canning, freezing and dry-packing plants. Food processors of all types are invited to write for Robins Catalog because many of these production-proved items are readily adaptable to processes other than canning.

A.K.Robins AND COMPANY, INC.

Manufacturers of Food Processing Machinery Since 1855

713-729 E. Lombard St., Baltimore 2, Md.

ENGINEERING SERVICE

Whether you're planning a completely new layout or adding new equipment, Robins offers you experienced assistance. For aid on such production problems as labor, material flow, or space, talk to Robins. Wire, write or phone.

Clinches A-1 Quality

—Continued from page 105

travel by an inclined rubber-belt conveyor to the first-floor sales cooler. Here, they are transferred onto tables for stacking into stationary racks. Products are loaded from the back for fifo (first-in, first-out) order selecting.

Free of sausage meat products, monorail-suspended trees go directly into the adjacent sausage stuffing room, ready for re-loading.

Slicing and Wrapping

As for those hanging items that are sliced and wrapped, they travel over scales to the first-floor pre-chill room (40-42 F.). In addition to curbing shrinkage and removing product-surface moisture, pre-chill room reduces initial load on the adjacent sales cooler without adverse effect on the quality of previously cooled products.

Items not to be sliced and packaged are loaded into racks, while empty trees travel, without backtracking, to the second-floor stuffing room.

Other sausage products go to the slicing-wrapping room. Here, meats are automatically sliced and stacked by two slicing machines (U. S.) with built-in scales. Stacks (7 oz. each) of sliced meats are then automatically inserted, two at a time, into cellophane-polyethylene pouches placed on metal mandrels.

Pouches are then vacuum-sealed by a dual-head machine (Flex-Vac) at the rate of 28 per min., and packed into shipping cases before they are transferred into the sales cooler.

Handling Meat Loaves

New efficiency is achieved with an improved method of oil-dipping meat loaves that go to the sales cooler. After leaving the multi-purpose smokehouse, loaves are cooled, then dipped into a vegetable oil bath.

Dipping operations have now been speeded up by a simple handling system that resulted from an investigation of methods. Loaves are now being transferred, nine at a time, while others are oil-dipped.

It's done this way: Nine loaves are transferred from portable racks onto the single oil-dip rack. Operating a hand lever, a girl immerses them in the oil bath. Then she transfers nine more loaves from the portable rack onto a stationary feed table adjacent to the oil dipping unit.

Once initially dipped, time-saving steps follow: Loaves are dumped from oil-dipping unit onto another stationary table. Then those from feed table are loaded into oil-dipping unit and another group of loaves is transferred from portable rack to feed table. Cooled, oil-dipped loaves are also transferred from second table to empty portable rack for later movement into sales cooler. Loaves are discharged from oil-dipping unit onto second table, and the transferring and dripping cycle is repeated.

Formerly, the girl's routine was loading the oil-dipping unit, lowering the loaves into the oil bath, waiting for them to be coated, raising and dumping the oil-coated loaves on a table, and loading them onto an empty rack.

Products stuffed into metal molds and cooked in the four stainless steel cooking vats previously mentioned are directly transported to one of the first-floor coolers (42-45 F.).

Here, a pneumatic stuffer is used to remove loaf goods semi-automatically from metal molds and to pack them into casings (Pliofilm). Stuffed loaves are then loaded onto monorail-mounted shelves for delivery to the first-floor sales cooler.

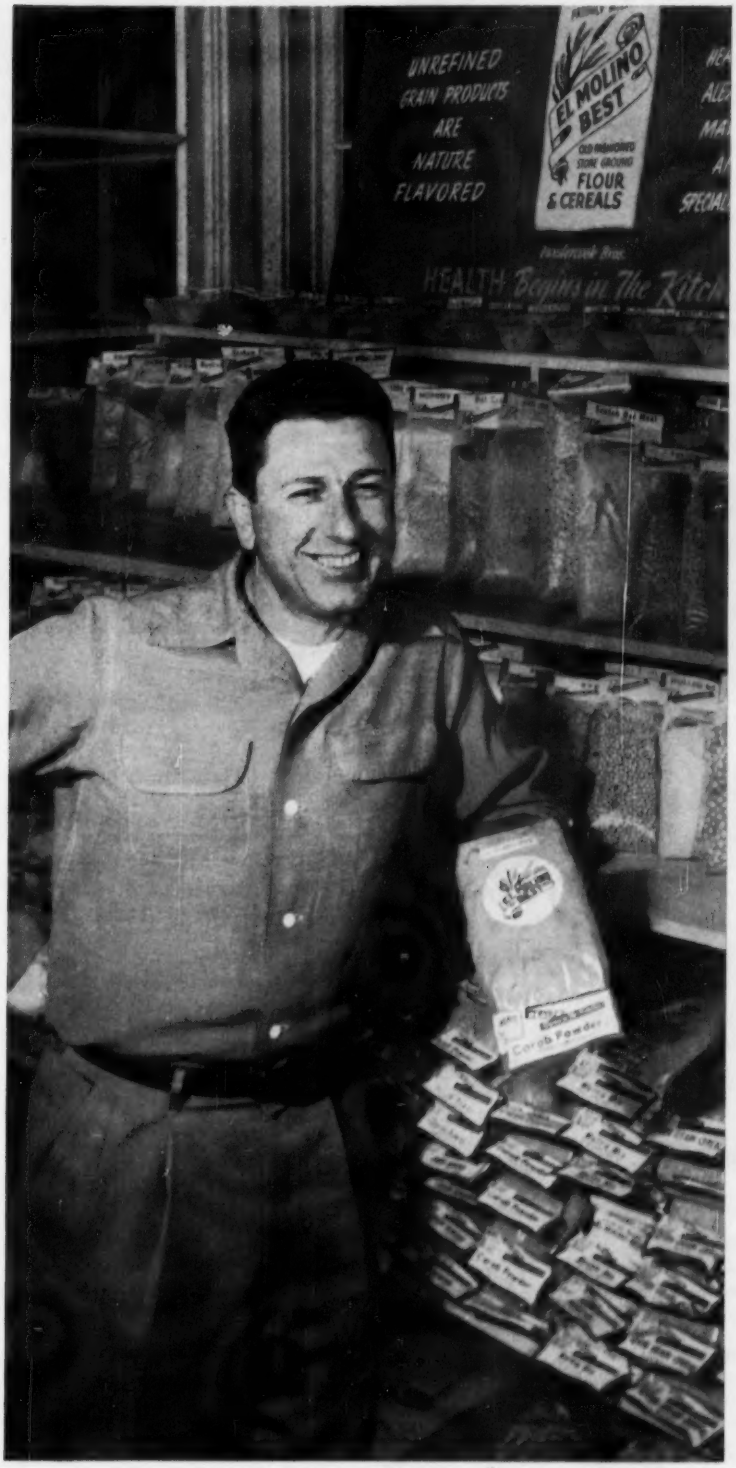
A simple trick has been devised to keep stacks of the film casing warm and pliable for easy, one-at-a-time transfer onto the stuffing mandrel.

Coming in Future Issues of FE

Whatever the nature of your plant operating problems, you will find helpful articles in future FE issues. Here are a few samples:

Answers to Troublesome Questions on Grievance Arbitration
System for Efficient Centralized Fumigation
How Electronic Weighing Speeds Plant Operations
New Meter Replaces Art With Science in Making Cottage Cheese
Packaging-Line Modernization Ups Capacity, Accuracy
Benefits in Bulk Handling of Dry Material
Properties of High-Conversion Corn Syrup as Ingredient
Advanced Engineering Boosts Brewery Performance
Freezer Introduces New Efficiency Into Processing and Handling
Innovations in Manufacture and Packaging of Cookies
Jam and Jelly Line Made Continuous

DEFINITELY it pays to package in film made of BAKELITE Polyethylene



Packaging by **Howard Plastics,** Council Bluffs, Iowa

"problems were completely eliminated"

That's the overall picture of the job that packaging in film made of BAKELITE Brand Polyethylene does for El Molino Mills, Alhambra, Calif. The Vandercook brothers, owners and partners, divide their success story into two parts — *results,* and *reasons.*

The RESULTS:

- "Our sales have increased 10 times since we made the change to polyethylene.
- "Sales of muffin mix increased 300% the first year.
- "There have been savings right down the line . . . to us, to the retailer and consumer. While costs to consumers are steadily rising in nearly all items on the market today, our products are selling for less — all because of polyethylene bags."

The REASONS:

- "Polyethylene bags will stand up under the roughest treatment.
- "Our products are highly perishable. Today, in easily sealed polyethylene bags, oxidation and rancidity don't take place . . . and they ship for any distance without infestation.
- "Not only does polyethylene increase the shelf life of our product, but it makes it look so much better. Retail outlets are exceedingly happy."

There are many sound reasons why packaging in film made of BAKELITE Polyethylene can bring the same, and even more advantages to the food products you market. Call your packaging supplier.

SPECIFY FILM MADE OF

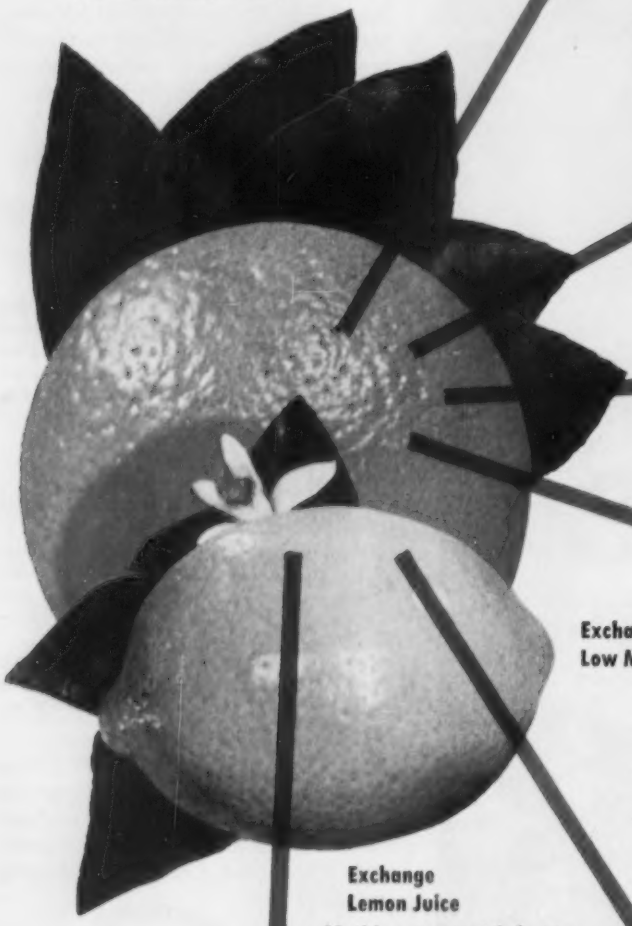
BAKELITE
BRAND
Polyethylene Plastic

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

Look to Sunkist
for progressive research in food processing

Yes, in every field of food processing, the Sunkist Growers laboratories are making ever-widening contributions to the increased quality of food products. Here are some typical Exchange Brand product developments.



Exchange Oil of Orange

Always consistent, always outstanding in flavor, strength and aroma. An essence you can rely on. Made from fruit grown in the famous Sunkist groves of California.

Exchange Oil of Lemon

The 4-to-1 favorite over all other lemon oils combined! The reason is the superior flavor that comes only from California-grown lemons processed by exacting Sunkist standards.

Exchange Preserver's Pectin

Here is *even* jell strength that gives you consistent, complete reliability in setting control.

Exchange Low Methoxyl Pectin

A natural fruit pectin that jells without sugar. Completely tasteless, permitting the use of the most delicate flavors. Pies made with Exchange Low Methoxyl Pectin won't "run" or "weep" when cut—and you have never tasted such natural juicy fruit flavor. Famous too for aspics, jellied fruit or vegetable salads, dietetic preserves or non-sugar jells.

Exchange Lemon Juice

Nothing can match lemon juice for bringing out the natural flavor of *any* food product. It's a superior acidulant in the preparation of mayonnaise, fruit cocktail, figs, fruit nectar, prunes and other heavy-syrup products. Highly effective as an anti-oxidant in processing frozen foods. Citric acid molecules have also been established as effective in the retarding of mold growth. Available in concentrated or single strength form.

Sunkist Growers

Exchange ®

PRODUCE DEPARTMENT • ONTARIO, CALIFORNIA
400 W. Madison Street, Chicago 6, Illinois
99 Hudson Street, New York 13, N. Y.
318 Cadiz Street, Dallas 2, Texas

Employed as a heat source is a 100w. infra-red light bulb.

Each time the stainless steel molds are used, they are washed with warm detergent and germicide solutions. After molds are rinsed and drained, they are spray-coated with an edible-oil solution containing an approved antioxidant. This is done with a 5-gal.-capacity unit (Brinks).

Basement has facilities for: (1) Curing meats, (2) preparing and cooling pickle, (3) tying natural casings, and (4) blending spices.

Further Features

In addition, there are locker and wash rooms, combination lunch and sales-meeting room, maintenance room, boiler room, and refrigeration room.

A 50-hp., oil-fired boiler furnishes the plant's steam. Excess steam is piped to a water heater, where temperature is raised to 180 F. But if the load on the boiler is too great, steam flow to the heater is automatically cut off. Water (180 F.) is then piped from the steam heater to a gas-fired water heater that raises its temperature to the desired level.

An incinerator (in the boiler room), eliminates accumulation of trash heaps, since it can be easily fed from any of the three floors.

Rigid Inspections, Sanitation

Especially significant in Thiele's quality control system are the many product and process checkups.

Daily, the plant superintendent and sausage maker make plant tours to taste-test products to curb variations in quality. They also check process deviations, condition of machines, and production areas.

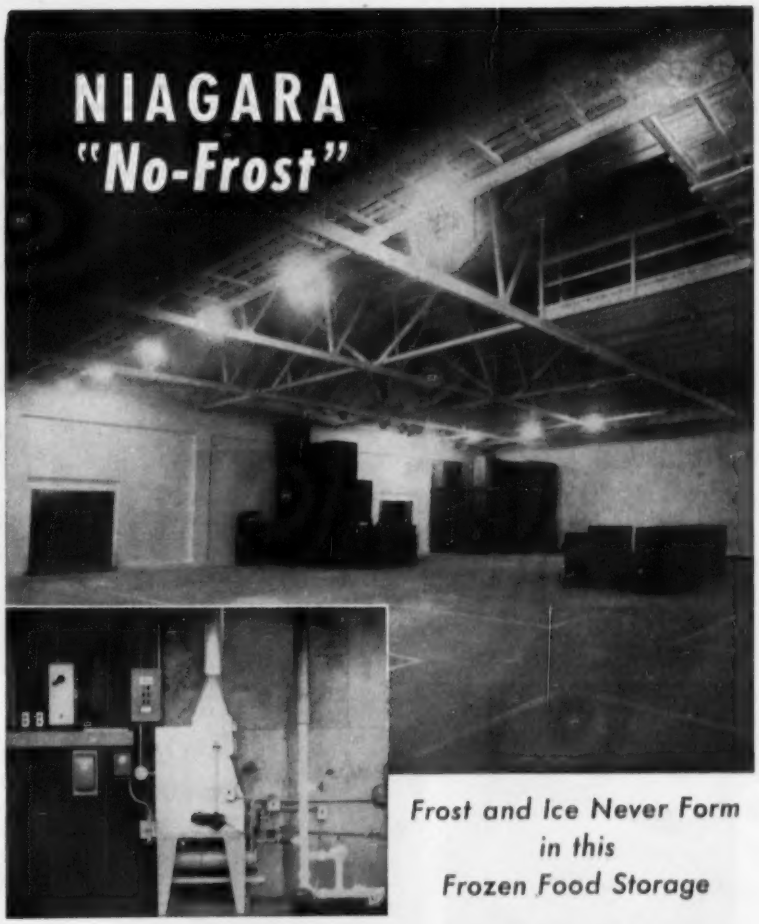
Key personnel meet once a week to check on uniformity of sausage products, examine competitive items, and comment on new ones. Through close cooperation with the sales force, the production department obtains comments and suggestions on consumer preferences.

Sanitation—companion to quality control—also gets top billing. The maintenance and cleanliness program is rigidly enforced.

Two men clean up the entire building at the end of each production day. All coolers are washed twice a week. Delivery trucks are washed and disinfected once a week. Entire plant—inside and out—is painted every year.

Trucks, too, are painted as often as needed. And salesmen wear a clean white frock every day, keeping an extra one in the truck.

End (Resume reading on page 107)



Frost and Ice Never Form in this Frozen Food Storage

SAVE TROUBLE AND EXPENSE EVERY DAY IN PRE-COOLING, FREEZING AND STORAGE; PROTECT FRESH OR FROZEN FOOD QUALITY

The Niagara "No-Frost" Method gives you always the full capacity you paid for in your refrigeration, NEVER, not even partially, interrupted for defrosting. You can handle large "live" loads easily. The controls are simple and always give you accurately the temperature and humidity you want. Temperatures never rise to interrupt the "pull-down". You are free of troubles; your rooms stay clean and sweet with easier maintenance and less labor. You save power; your compressors run at higher suction pressures. For every refrigerated room for temperatures below 32° F. this method gives you better product quality at lower operating costs. Many of the finest installations in the industry, both large and small, prove the benefits of the Niagara No-Frost Method.

Write for the No-Frost story and data on its application to your problem. Ask for Bulletin No. 105.

NIAGARA BLOWER COMPANY
DEPT. FI405 LEXINGTON AVENUE, NEW YORK 17, N. Y.

OVER 15 YEARS OF SUCCESSFUL EXPERIENCE PROVES THE VALUE OF NIAGARA NO-FROST

For more information, use coupon on last page.

NEW PACKAGES & PRODUCTS

DOMESTIC AND IMPORTED specialty foods spotted at show included—Top row: Antiqued-wood chocolate box, canned sliced celery knobs, Israeli chocolate, and new French cream cheese. Middle row: Biscuits made of shortening and Gouda cheese, triangular chocolate bars, and line of unusual gourmet soups. Left: Cream-filled pastry sticks made in four hand operations, and pork rinds in five flavors.

First Fancy Food & Confection Show

The initial annual Fancy Food & Confection Show, held in New York City in late August, displayed a wide variety of candy and specialty foods to the trade.

The booth of Moore & Co., Newark, sported an unusual line of 23 gourmet soups. Packed under the Bon Vivant label, the line included black bean, crab bisque, cream of almond, cream of watercress, cream of artichoke, cream of broccoli, cream of cucumber, cream of lobster and mushroom, cream vichyssoise, and thick green turtle soups (all reported as canned soup firsts).

The soups are packed in tall 13-oz. cans. Labels feature the Paris scene that is the company's family identification. Super-imposed on this is a reproduction of the prepared soup.

A unique feature of the processing is the fact that each batch of soup is personally taste-tested by the company's president, Francis J. Castelli.

Canned cleaned shrimp were exhibited by Robinson Canning Co., Inc., New Orleans. Packed in three sizes in 4½-oz. and 6¾-oz. tins, the shrimp have the back strip removed. Brand name is Salad.

C. J. Willenborg, Inc., Hoboken, displayed a triangular chocolate bar and an attractive new chocolate package, both processed by Chocolat Tobler American Corp.

The triangular chocolate bar, labeled Toblerone, is made in 2- and 3-oz. bars. A blend of milk chocolate, honey, and almonds, it is notched for easy portion control.

The unusual shape lends itself to new packaging ideas. Six of the bars, for example, may be tied together with ribbon and cellophane wrapped to make a hexagonal package. The box for counter display is sloped in front to permit tight packing of the bars.

A "Precious Cargo" of chocolates is packaged in a luxurious wooden box surmounted with a wax seal. The wood has a dull, aged finish.

Employing four individual hand operations, pastry sticks filled with chocolate-coffee or chocolate-hazelnut cream were displayed by Roll Biscuit Co., Inc., New York City.

Called stickettes, the confections are known in Switzerland as hohlhueppen. The New York City processor is reported to be the only American company making the sticks according to the Swiss formula.

Sticks are baked from liquid batter in about a min. Hand rolled off the hot baking plates, they are cooled and hand filled on a machine of the company's own design. The sticks are then chilled and hand packed in 6- and 8-oz. tins. From 17 to 22 sticks are packed in each box.

Confection Houses

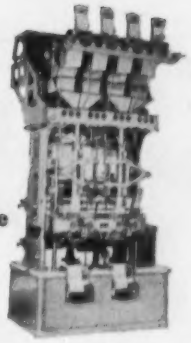
Two do-it-yourself confection houses were seen at the show.

A candy house kit which uses standard packages of candy to decorate a

PROTECTED BY RIEGEL

DROMEDARY CAKE MIX CONTAINS TWO POUCHES (ONE LAYER EACH). USES SPECIAL RIEGEL POUCHPAK* OF LAMINATED GLASSINE, POLY-COATED AND PRINTED BY RIEGEL. *TM

48 to 60 PACKAGES PER MINUTE
Hayssen Model "F"
Complete Packaging Machine



Protecting the sales-winning qualities of fine products is only one of the many functions of Riegel papers. Saving money is important, too. Riegel does it for you by creating the right combination of the most efficient packaging materials . . . and by "tailor-making" the paper to run and seal at high speeds on your machines. Tell us what you want paper to do for you. Riegel Paper Corporation, P.O. Box 170, Grand Central Sta., New York 17, N. Y.

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Plain • Waxed • Printed • Lacquer-Coated • Laminated

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quality is more than skin deep...

with VICTOR BELTING

Sure the "skin" is important... it's the surface that touches the food. But the life expectancy of the base belting itself is where quality really shows.

Realizing this, our research department conducts continuous, exacting tests on belt wear and life to make certain the components of Victor Belting are the best suited to give long service, to permit thorough removal of food residue, and to keep "belt-taste" from the food being handled. That's why—with complete confidence—we recommend for your food handling:

VICTOR SUPRENE . . . special-woven cotton duck belting thoroughly impregnated with a Neoprene compound. Waterproof, resistant to grease and most food chemicals, smooth-surfaced, and easily cleaned.

VICTOR 475 . . . highest quality, solid-woven cotton belting impregnated and coated with a Neoprene compound. Developed for use where cleanliness is a must. Washable with hot water or steam. Resists rancidity and

For food handling the modern sanitary way select from—

A COMPLETE LINE including:

- Neoprene Belting • Balata Belting
- Solid-Woven Belting • Hycar Belting
- Canvas Stitched Belting
- Belting Specialties

3281

Victor Balata & Textile Belting Co.

33 Park Pl., N. Y. 7

200-6 W. Hubbard St., Chicago 10

cardboard frame is made by Howard B. Stark Co., Milwaukee. The frame is coated with icing and candies in the kit—sugar wafers, smirkles, fairy breathlets, candy cigarettes, cut rock candy, gumdrops and spearmint leaves—are used to decorate it. A packet of green sugar provides a lawn.

Package is a colorful rectangular carton, the lid wrapped in cellophane.

A lebkuchen or spice cake house was a highlight at the Liberty Import Corp. booth. Made by Gebruder Schmidt Mainbernheim in Bavaria, the Hansel and Gretel house is made by joining the sides and roof with dowels. An icing is then used to decorate it and secure candy and cookies to the roof. Three candy figures are included. Base and lid of the box are used to provide a backdrop.

Exhibited by the same importer were attractive biscuit tins with the Biscuiterie Nantaise label. Each is decorated with a Paris watercolor scene, done specially for the package by a noted artist. A panel set in the recessed bottom of the box is a full-size illustration of the contents—complete to corrugated cardboard packing. Thus, the purchaser has a full view of the biscuits.

A Triple Creme cheese was displayed at the booth of Schratter Import Co. Made of pure cow's milk and 25% pure cream, this is a pasteurized cheese.

Fried bacon rinds in five flavors were shown by Filler Products, Inc., Atlanta, Ga. The rinds, each flavor identified by a different colored label, are made in regular, onion, garlic, cheese, and barbecue. Called Bake-N-Krisp, product is packed in glass jars.

Scotch on the Hocks

Canned Danish cooked hams are packed in champagne, burgundy, Danish cherry wine, tawny port, Spanish sherry, and scotch whiskey under the Gala Foods label. The New York company also exhibited canape crackers or cocktail flowers, packed 70 to a tin. This was supplemented by three smorgasbord dips, curry, herring and beets, and Danish cheese, in 13-oz. jars. A red and white cord around the cap adds a touch of color.

Cheese Crispies imported from the Netherlands were displayed by Murdan Foods Co., Inc., New York City. Made from Gouda cheese, vegetable shortening, flour and salt, the biscuits are processed in Delft.

The delicate cocktail crackers are heat-sealed in cellophane and then packed in an 8-oz. tin. The box includes a booklet in four languages explaining the best way to serve the crackers. A divider prevents breakage.

Chocolates from Israel and canned celery knobs were spotted at the Amco Shippers booth.

The chocolates, packaged under the Lieber Star label, included both paper

DO IT YOURSELF confection houses include lebkuchen "witchhouse" (top) and ranch-type house made by sticking candies on cardboard frame (bottom).

and foil wrapped bars and boxes of individually wrapped tablets. Flavors are bittersweet, coffee milk, almond milk, milk, and fine bitter. The boxes for tablets are gold colored and overwrapped with cellophane. One side is labeled in English, the other side in Hebrew.

The bars are made in 1¾- and 3½-oz. sizes.

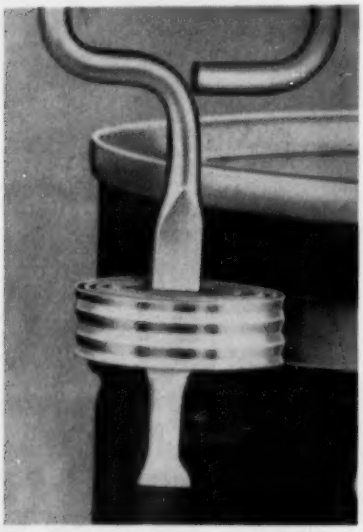
Also using the Lieber label is a milk chocolate flake with added lecithin, emulsifier, vanillin, and artificial flavor. It is similar to puffed chocolate.

Canned sliced celery knobs, the base of the plant, are packed under the Helvetia label. Sizes are 15½-oz. and 1 lb. 14 oz. The striking black and white label, with color used in a picture of the product, has high identification value. Processor is located in Western Germany.

Hawaiian Fruit Mixture

A fresh frozen fruit product called Hawaiian Fruits is being packed by Dole Pineapple at their Honolulu cannery. A mixture of papaya, apple bananas, and pineapple, the product is packed in guava and pineapple juice with sugar.

This marks the first time that Dole has processed any food other than pineapple. Site of test marketing is the West Coast.

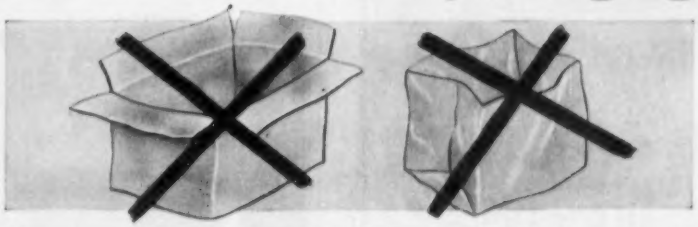


Beaded Rip Strip

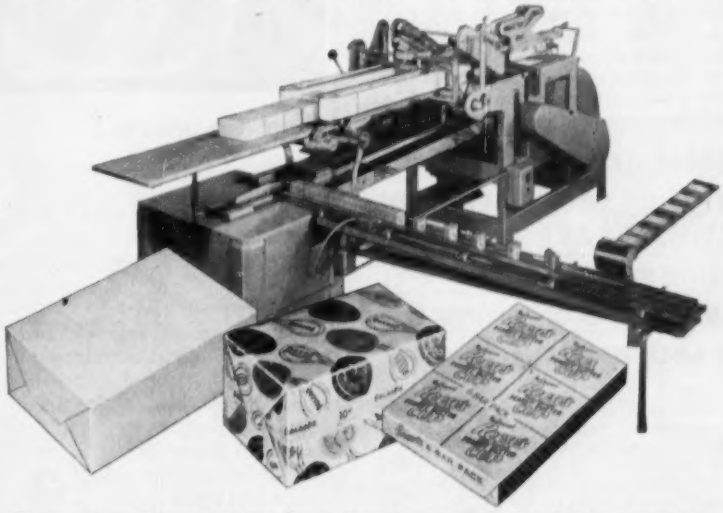
Reported to prevent off-key unwinding on Nos. 1 and 2 coffee cans is a beaded rip-strip developed by Continental Can Co. Called Gripstrip, it consists of a multiple bead within the score lines of the strip, adding a self-tracking feature that keeps the strip on the key during unwinding.

Each turn of the key locks one sec-

ACCUMULATOR and BUNDLER solves outmoded packaging



If you are still using expensive bulky heavy cartons and loose-fitting bags to gather your smaller packages into one larger unit, we can cut your costs with the new all-automatic Accumulator and Bundler. Eliminate carton and bag cost and inventory. Save on labor, hand filling and handling costs. Give your products a more secure modern container, tamper-proof factory sealed assurance.



Hayssen Accumulator and Bundler gathers from a single line feed any number of individual rectangular, tapered or cylindrical packages into a neatly stacked arrangement and automatically overwraps them with paper, film or foil, as you desire, into one tight, easily handled, protective bundle.

Manufacturers of the following products are today saving with Hayssen Automatic Accumulating and Bundling: Books, Matches, Butter, Bird Seed, Boxes of Screws, Nails, Tacks, Beans, Ice Cream, Candy, Confections, Cheese, Cough Drops, Cookies, Dessert Mix, Dried Fruits, Raisins, Cosmetics, Drug Items, Gelatin, Rice, Frozen Food Cartons, Soup Mix, Tea, Tapioca, Toothpaste, Toilet Tissue, Yeast and many others.

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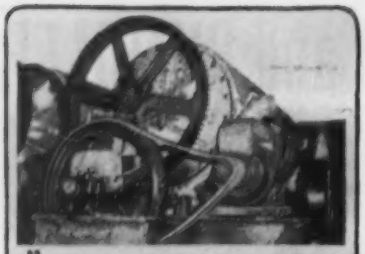

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tion of the strip against the next, all the way around the can. Also, the beading adds strength to the body of the can at no extra cost to the packer.

It is planned to incorporate the Gripstrip in shortening and key-opening meat cans.

Circle 163A on Reader Service Card

Bags for Meats

The problem of neatly packaging such products as liver, kidneys, and scallops is reported solved with Dobeckmun Co.'s Multi-Meat Bag. Made of strong, transparent polyethylene-coated cellophane, the bags come in two sizes 6 x 6½ and 6 x 9.

The leakproof bags eliminate the need for trays and overwraps since the food is just dropped in the bag and the package heat sealed, ready for display. Contents are completely visible to the consumer.

Only equipment needed is a loader and a heat sealer.

Circle 164A on Reader Service Card

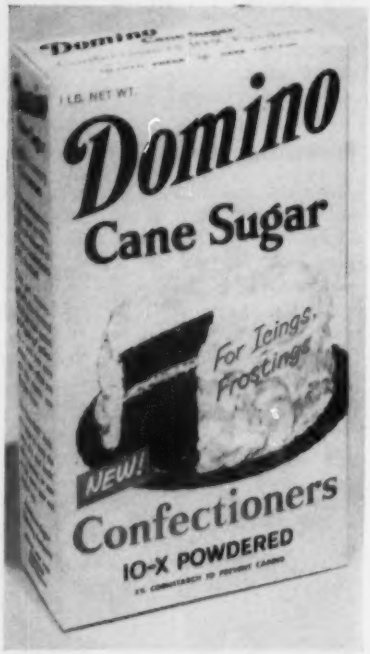
Shrimp Cocktail for Two

Cocktail shrimp which are cooked in their own package are being marketed by SeaPak Corp., St. Simons Island, Ga. To prepare the shrimp, the aluminum foil envelope containing eight large cleaned shrimp is placed unopened in boiling water for twelve min. Then, still sealed, the package is chilled for a few minutes. The package is opened, the shrimp rinsed and then served.

The unique package protects flavor since the shrimp are heated in their own natural juices and since no water penetrates the package. No cooking odors escape and shelling and deveining are eliminated.

SeaPak worked with Reynolds Metals Co. to development package machinery for the shrimp. Equipment now in use can produce 50,000 packages daily.

Circle 164B on Reader Service Card



New Confectioner's Sugar

Reported to be 50% finer than standard XXXX confectioner's sugar, Domino 10-X has been introduced by American Sugar Refining Co. The extra fine sugar will enable the housewife to make smoother and creamier no-cook icings.

Developed after extensive research and taste testing, the new sugar is packaged in a 1-lb. picture package incorporating the processor's Stay-Soft moisture control liner.

Introduced earlier this year was Instant Superfine, said to dissolve twice as fast as the company's former Superfine. It is ideal for summer beverages, cereals, and icings.

Circle 164C on Reader Service Card

Clambake in a Can

Live lobsters and clams packed in seaweed are distributed nationally by Saltwater Farms, Inc., Damariscotta,

Me. Ice is packed with the seafood to protect the food. The 15- and 51-oz. tins in which the seafood is shipped are used as cooking containers after holes have been punched in the lids.

Two New Canned Foods

Kidney bean salad and chicken with rice are latest additions to the Libby, McNeill & Libby line of canned foods.

The red kidney bean salad is served after chilling. Packed in a 10-oz. can, the salad includes kidney beans, pickles, celery, vinegar, sugar, onion, salt, mustard, and cornstarch.

Long grain converted rice, peas, carrots, and Grade A cut chicken are the ingredients of the second product. Particularly suitable as a luncheon dish, it is heated before serving.

Spud-Coated Wieners

'Tater Dogs—frankfurters on a stick wrapped in french fried potatoes—are a new product of 'Tater Products Co., Cedar Rapids, Iowa.

Four of the frankfurters are packed in a carton carrying the company's trademark, a dachshund. Ingredients are frankfurter, pre-cooked potato, shortening, salt, egg yolk solids, flour, vegetable stabilizer, and milk protein derivative.

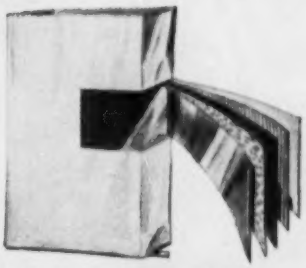
Aseptic Process Liner

More flavor protection for foods and beverages packed in metal containers is claimed with a new heat-resistant liner made by Crown Cork & Seal Co.'s can division.

Made of resinous, plastic-like mate-

Here's Multiwall Shipping Sack Selection

One to five walls . . any type material



Whatever your needs — one to five walls of whatever type paper required — asphalt, double strength kraft, blue liner, polyethylene, in any combination — readily available.

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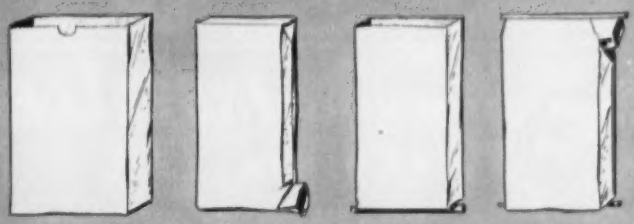
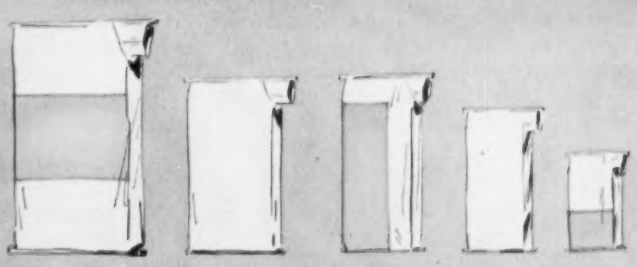
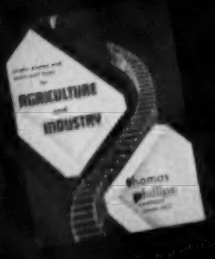


Open mouth or valve, in sewn or pasted styles, to exactly suit your filling requirements.

. . . in any size . . mixed carloads



From two to 100 pound capacities — and shipped in mixed car lots where desirable.



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WITH SANI-BRICK *INSTALLED*
BY DREHMANN

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rial, the liner is adaptable to aseptic canning (requiring pre-sterilization of the container at 500 deg. F.) of dairy foods, soups, and vegetables. It has high chemical resistance and fabrication properties in addition to resisting heat.

Circle 165A on Reader Service Card

Vac-Packed Frozen Lamb

Armour and Company has introduced frozen lamb cuts pre-wrapped in polyethylene bags. The vacuum bag clings to the meat contour and adds eye appeal, as well as providing full view of the meat. Printed on each bag is the type of cut (leg of lamb, leg and mutton rump, boned, rolled, and tied shoulders, and shanks) and brand identification.

New Product Shorts

Chocolate Angel Cake is made by adding water to mix being test marketed in Washington by Pillsbury Mills.

Individual Sugar Servings of California and Hawaiian Sugar Corp. are packaged in envelopes of polyethylene-coated paper made by Crown Zellerbach Corp.

No Deposit 7-oz. bottle is used by No.Cal Beverage Corp. to supplement 16-oz. size.

Lemon Powder has been developed by USDA. Not yet in production, it is reported to be rich in natural flavor.

Instant Milk made by Foremost Dairies is being introduced in California.

Latest Strained Soup added to H. J. Heinz line is strained macaroni, tomatoes, beef, and bacon.

High-Gloss Wrap for frozen foods, Marathon Corp.'s Glamakote, offers durable finish with extra sheen.

Strawberry Instant is latest and fifth Jell-O pudding.

Dietetic Wine is processed by Antonia Mecca, Milan, Italy, under the Vino Vino label.

Chocolate Christmas Cards are processed and packaged in colorful mailing cartons by Cook Chocolate Co., Chicago.

Frozen Shrimp is distributed in both cans (cocktail) and cartons (breaded fantail) by Crosse & Blackwell Co., Baltimore.

Hush Puppy Mix is new product of Dell Food Specialties Co., Beloit, Wis. A 1-lb. package makes 70 corn biscuits.

Three-in-One Pack for Nabisco's Waverly Wafers has been announced. Three packets are contained in large carton.

New Flavor for White Rock Corp. beverages is Kula Waii Pineapple.

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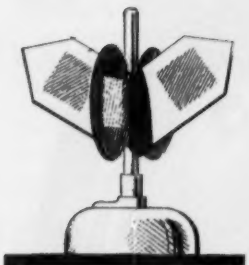

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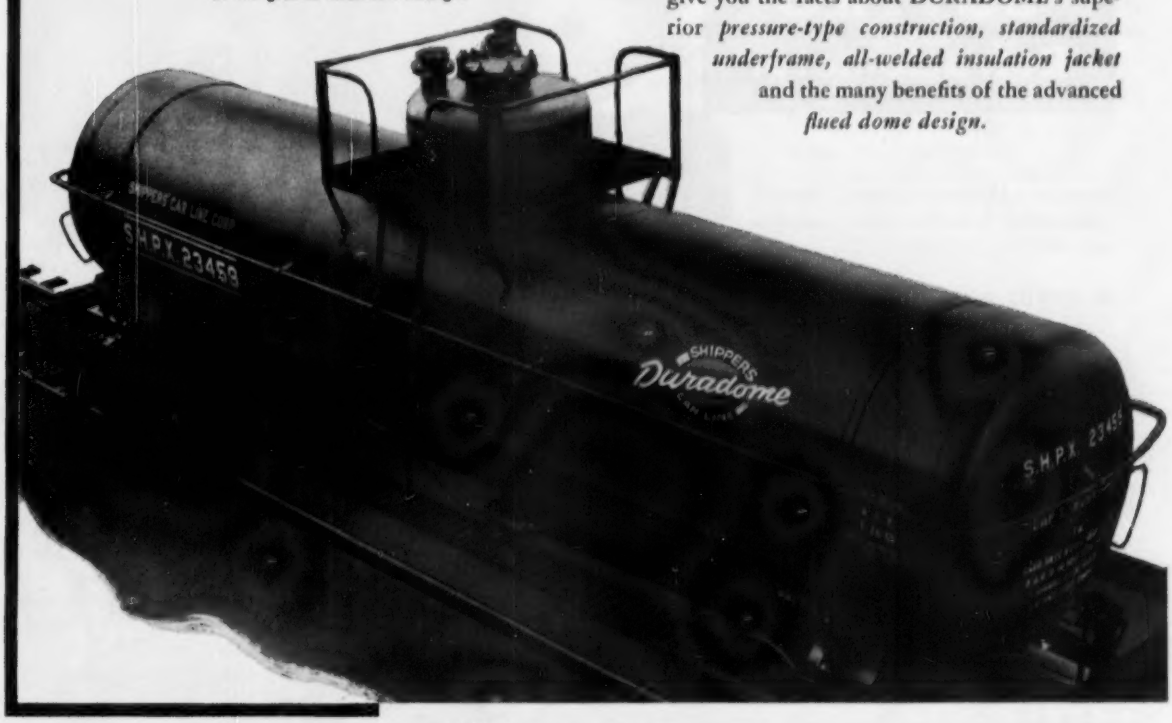

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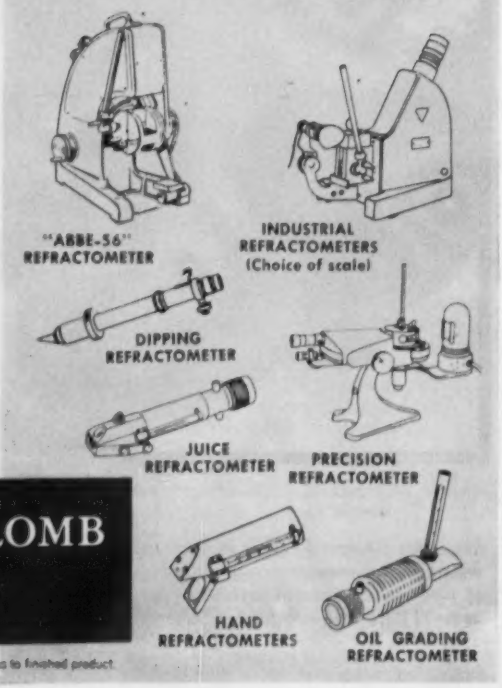

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Spoilage of Cream Filling Inhibited by Serine

In a study of the indigenous flora responsible for spoilage of vanilla cream filling it was found that serine, cysteine, and thioglycollic acid exerted a bacteriostatic effect upon the spore-forming bacilli.

Glycine was not inhibitory. In fact it counteracted the bacteriostatic effect of serine. Racemic serine was more bacteriostatic than either the D-isomer or the L-isomer, although both had an inhibiting effect when used separately.

Various ingredients in cream filling affected the inhibitory action of serine. Coconut and cocoa completely neutralized its bacteriostatic effect upon staphylococci, whereas serine exerted a pronounced inhibition in pineapple cream filling. The preservative effect of DL-serine was quite marked at 24 hr. at 100 F., but did not reach 48 hr. at either 87 or 100 F. These results were obtained in laboratory experiments, and under commercial conditions in a large bakery.—*Applied Microbiology*, 132-35, May, 1955.

Low Temperature and pH Up Cottage Cheese Life

By studying the bacteria responsible for surface spoilage of cottage cheese, it was found that fruitness caused by the growth of *P. fragi* was the most common defect limiting the storage life of the product. *P. Viscosa* and *A. metalcaligenes* also caused surface spoilage at initial pH values as low as 4.6 and at temperatures as low as 40 F.

These defects develop slowly at low pH values and very slowly at 40 F. Low pH values retarded *P. viscosa* less than they retarded the other two; low temperature retarded *P. fragi* less than they retarded the other two. Experimental data indicate that low temperature is important as a means of retarding the production of defects by the bacteria mentioned.

Development of defective odor or appearance required longer storage periods at 50 F. than at 60 F., and considerably longer periods at 40 F. Careful maintenance of low temperature as early as possible during the processing of cottage cheese curd and during storage of the finished product should be of advantage in preventing deterioration.—*Journal of Milk & Food Technology*, 169-71, May, 1955.

New Volatile Flavor Recovery Process Strips With Noncondensable Gas

Removal of volatile flavor esters from fruit juices by stripping with nitrogen or other inert gases at moderate temperatures, then cooling the gas to condense the flavor in water vapor is the subject of a recently patented invention.

Process and equipment is also applicable to recovery of flavors lost during preserve, jam and marmalade making.

In the process, freshly pressed juice is preheated to 120-130 F., then fed continuously to a hot-water-jacketed stripping tank where it flows downward over Rashig rings. Gas enters bottom of tank, is fed to juice through distributor pipe and moves upward counter to flow of juice. Stripped juice is removed continuously from bottom of tank. Baffles at top of tank prevent drops of juice from being carried over with the gas.

Gas carrying water vapor and volatile flavors, goes to liquid-vapor separator for removal of foam, then to germ filter, and to first condenser where it is cooled to 30-32 F.

Leaving here it is compressed to between 14 and 3 atmospheres then enters 2nd condenser where it is cooled to 15-25 F. Next comes 3rd condenser where gas temperature between 0 and 10 F. is attained. Additional condensers operated at increasingly low temperatures may be used.

Gas from final condenser passes check valve where its pressure is reduced then enters carbon-packed adsorber for removal of traces of flavor. From here it is recycled (with addition of make-up gas) to the stripping tank.

Operating temperatures and pressures, and number of condensers may be varied according to the heat sensitiveness of the juice being treated.

Flavors are contained in the condensed water vapor in first condenser. In succeeding ones, they are in the ice that settles out. By shutting off refrigeration in these the ice melts and resulting liquid is drawn off. Essences from the different stages may be combined or kept separate. Essence is recovered from adsorber by steaming, condensing the vapors in above described apparatus, and venting noncondensables to the air.

In the recovery of flavors from preserving, the air in and above the kettles is noncondensable and carries esters through condensers. Air and flavor are withdrawn from closed kettles and from hoods above open units, then pumped through condensing system.—U. S. Patent 2,714,573, Aug. 2, 1955.

Effect of Antibiotics on Microflora of Milk

Antibiotics as preservatives in food products offer the possibility of improving keeping quality without injury to the normal character of the food.

In dairy products, however, presence of antibiotics has been shown to affect growth and reproduction of lactic acid bacteria used for starter cultures. To test their effect on the general milk flora, penicillin, streptomycin, bacitracin, chloromycetin, aureomycin, and terramycin were added to sterile milk inoculated with both desirable and undesirable microorganisms at the rate of 20,000 per ml.

Three levels of antibiotic were used. Cultures were examined daily for physical evidence of spoilage, and plate counts were made after 2, 4, 7, 14 and 21 days.

Terramycin, aureomycin, and chloromycetin were most effective against both mixed and pure cultures of bacteria in milk, and were the most active against undesirable bacteria, such as *E. coli* or *M. pyogenes*. Penicillin was the most effective in preventing growth of desirable lactic acid bacteria, though all of the antibiotics affected lactic acid starter cultures. Yeasts in dairy products were resistant to *all* the antibiotics tried.—*Applied Microbiology* 3, 234-37, 1955.

Preventing Oxidized Flavor In Unhomogenized Milk

By the simple expedient of adding a small quantity of homogenized milk to unhomogenized milk it is possible to retard or prevent development of oxidized flavor in the mixture.

According to the specifications of

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Aerial view of our Plant No. 1, Brooklyn, N. Y.

a recent patent, this result can be accomplished without destroying the cream line and without apparent effect on the volume of cream raised. The quantity of homogenized milk used in the process varies with the susceptibility of the milk to the development of oxidized flavor, ranging from 5-45%.

In amounts larger than 45% the cream volume of the unhomogenized milk is reduced and the cream line is raised. As little as 17.5% of homogenized milk will be effective with highly susceptible milks, and as little as 5% can be used where milk is only slightly susceptible to development of this flavor. The process is effective even after storage of the treated milk for at least 96 hr. at 40F. after pasteurizing.

Temperature of unhomogenized milk at the time of mixture is not important in inhibiting oxidized flavor, but it is quite important in maintaining the cream line. Latter is also affected by the use of raw or pasteurized unhomogenized milk. When raw unhomogenized milk is treated it should be in the temperature range 31-40F. at the time of mixture. If the raw milk temperature is above 60 deg. F. the cream line may be raised. When pasteurized unhomogenized milk is used it should be in the temperature range 110-165F., preferably at 145-165. If it is at 60 deg. F. or less, the cream line will be substantially raised—U. S. Patent 2,709,137, May 24, 1955.

Methyl Bromide Residues In Fumigated Wheat

By use of C^{14}-labeled methyl bromide, followed by C^{14} assay of fat, starch, gluten, and water-soluble fractions of wheat exposed to it, gluten was found responsible for 80% of methyl bromide decomposition products in fumigated grain.

Products formed were N-methyl derivatives (50%), dimethyl sulphonium derivatives (30%), and methoxyl and thiomethoxyl compounds (20%). Not more than 10% of the decomposition resulted in methanol formation.

Histidine, a semi-essential amino acid, is one of the compounds methylated by decomposition of methyl bromide, but under fumigation conditions its loss by methylation is negligible. Most likely compounds resulting are methanol, methyl glucoses, S-methylcysteine, methyl methionine sulphonium salts, and the N-methyl derivatives of histidine and lysine.

These compounds have been fed to mammals experimentally and *in*

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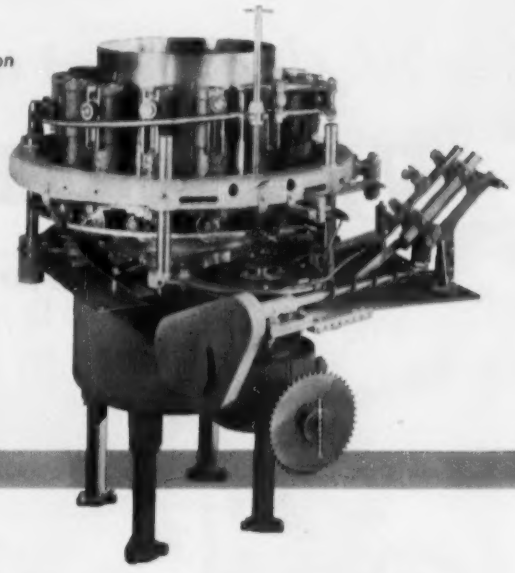

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Basically Pfaudler Piston Fillers are "foolproof." Note the design of valves and pistons (Fig. 1). Very simple. Very precise. Accurate to within $\pm \frac{1}{10}$ oz. Very easy to clean—no tools required to remove pistons or valves. You save time and money.

Spillage of product during filling is prevented by a no-can-no-fill device. Product waste is nil. Right at the start *you get a clean package.*

Adjustment of fill is made at one point, even while filler is running. *You save time, save product, keep up your production rate.*

Bearings and gears are automatically lubricated. Only three points on the filler are hand lubricated. So, because cleaning is simple, *maintenance is no problem.*

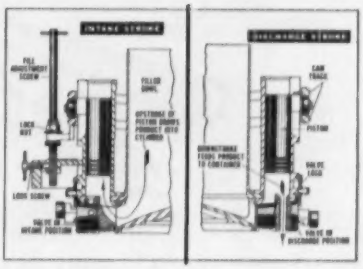

Fig. 1. These diagrams show position of operating parts of valve during intake and discharge strokes. Action is positive, volume of product precise.

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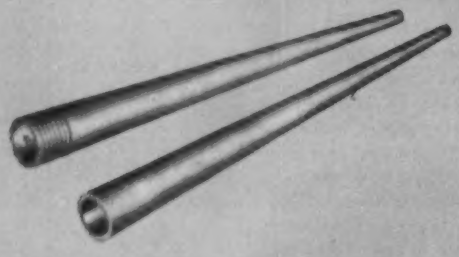

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vivo metabolism of some of them is at least partly understood. There is no evidence that methyl bromide fumigation results in toxic decomposition products, or in any significant impairment of nutritional quality.—*Journal of the Science of Food & Agriculture*, 6, 5, 251-74, 1955.

Iodophor Sanitizers Versus Chlorine

In a study of the effectiveness of some of the new iodine sanitizing agents, the effects of hard water, whole milk, and dishwash soil on bactericidal efficiency were investigated.

Among the findings, iodine liquid and iodine powder detergent sanitizers have equally good bactericidal properties. It was also shown that at 25 ppm. available iodine, the iodophors compared favorably with 100 ppm. available chlorine in killing *E. coli*, *S. typhosa*, *M. pyogenes* var. *aureus*, and *Ps. aeruginosa* in hard water, whole milk, and dishwash soil.

At 12.5 ppm. available iodine, the iodophors compared favorably with 100 ppm. of available chlorine in killing *E. coli* and *S. typhosa* under the above conditions, and with 100 ppm. available chlorine in killing *Ps. aeruginosa* and *M. pyogenes* var. *aureus* in distilled and hard water. If field tests substantiate these laboratory investigations, iodine detergent sanitizers can be recommended for sanitizing food utensils.—*Food Technology*, 144-146 and 149, July 1955.

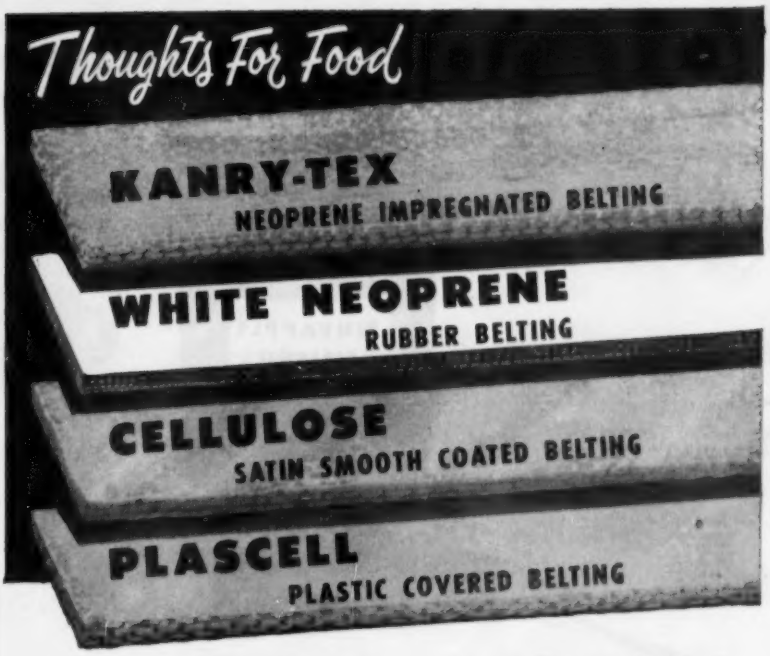
Enriched Rice Coated White

A process has been patented for vitamin coating rice and other cereal grains with a white substance, making them practically indistinguishable from unenriched grains. Thus the two may be combined in suitable proportions to give an enriched mixture in which the treated and untreated grains present the same appearance.

Without the coating, the enriched grains have a yellowish color that is noticeable when mixed with untreated white rice, suggesting undesirable product and causing consumer resistance.

The process involves alternate applications of a film-forming agent and a powdered whitening agent, repeated until a durable coating has been formed on the granules. Film-forming agent is insoluble in water and may be comprised of zein in an aqueous acetone solution, or shellac of the type known as pharmaceutical glaze.

Preferable whitening agents are tricalcium phosphate, magnesium carbonate, magnesium oxide, and talc.



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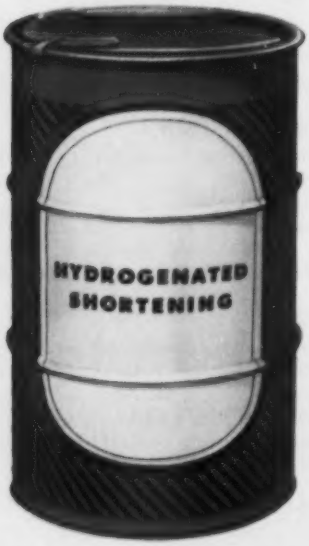

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The process is effected in a tumbling pan at a temperature of about 87 F. Alternate applications of film and whitening agent are applied until a coating has been formed that is about 5-7% by weight of the granules. —U. S. Patent 2,712,499, July 5, 1955.

Deep Fried Vegetable Chips

Crisp tasty chips of beets, carrots, and parsnips, similar to potato chips, and crunchy nuggets of peas and lima beans with a nutty flavor, have been prepared by frying in deep fat.

The pea and bean nuggets can be made into a spread by grinding, or converted into a fine powder, by freeze grinding, for use as a dry soup mix with suitable flavoring ingredients.

Finished product is influenced by variety of vegetable used and its maturity, thickness of slice, time and temperature of cooking, and type of oils. These factors vary for each of the vegetables.

Most suitable oil for the purpose is a modified coconut oil known as Dri-Fri. It does not precipitate on the surface of the product at ordinary room temperature, and is stable against oxidative rancidity for long periods of time.

Peas and beans that are overmature yield the best cooked nuggets. Being rich in protein, fat, and carbohydrates, they make highly nutritious food items. All of the products have been subjected to the reactions of 300 people who gave favorable opinions. No commercial production has thus far been undertaken.—*Food Technology*, 388-92, Aug. 1955.

Steam-Roasting of Coffee Ups Soluble Yield

Subjecting green coffee beans to saturated steam at a temperature of 338-435 F. and a pressure of 100-350 psi. will increase yield of soluble coffee derived therefrom as compared to coffee roasted in the conventional manner.

Apparatus used in the patented process comprises a pressure vessel in which are 4 perforated stainless steel baskets for green coffee beans. In operation, steam is introduced and allowed to attain a pressure of 150 lb. at a temperature of 360 F. These conditions are maintained for 8 min.,

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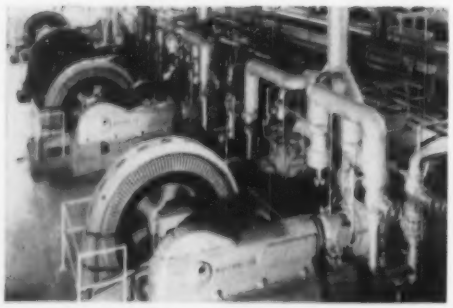

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then steam is shut off and pressure valves opened to permit pressure to drop to atmospheric level in about 3 min.

Vacuum (26 in. Hg) is applied and maintained for 6 min. This cools and dries the beans, which are then removed, further cooled, are ground and extracted with water in the usual manner. U. S. Patent 2,712,501, July 5, 1955.

Improved Salad Dressing

Substitution of butterfat for a part of the vegetable oil, and replacement of cooked starch with a milk solids dispersion are characteristics of a salad dressing, patent for which was recently granted.

Dressing comprises a soft plastic base made from dry skim milk, cream, sugar, salt, stabilizer and vinegar, or other edible acids, blended with mayonnaise.

In its production, the dried milk, sugar and stabilizer are dispersed in the cream and agitated until homogeneous. Mixture is heated to 175 deg., held 5-10 min., cooled to 140 when vinegar and salt are added. Further cooling caused mixture to form a paste, which is intimately blended with sufficient mayonnaise to give a product containing not less than 30% fat (milk and vegetable combined).—U. S. Patent 2,715,068, Aug. 9, 1955.

Volatile Flavors Retained In New Jelly Process

Superior quality of product and economy of processing time are claimed for a new concept in making fruit jelly, particularly the apple jelly which was produced in the experimental work.

Crux of the new method is to divide the juice for a given batch into two or three portions, only one of which is boiled to evaporate the required amount of water. Sugar and pectin are dissolved in a second portion, and all three are then combined and heated to the prescribed filling temperature. The process minimizes loss of volatile flavor, and reduces the formation of brown reaction products.

Two sugar systems were investigated. Sucrose plus dextrose, and sucrose plus dried corn syrup solids. Different lots of jelly were stored for two months at 32, 40, 70, and 100 F. Products were organoleptically evaluated for flavor, color, jelly character, and lack of off flavor.

Comparison of the two sugar systems showed no difference in flavor initially, but after storage the sucrose-

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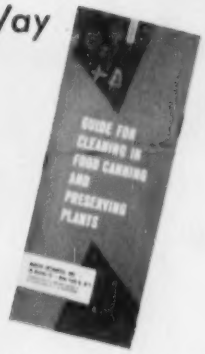

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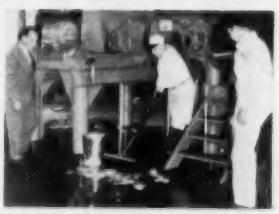

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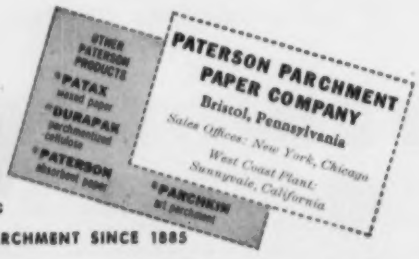

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dextrose system showed significantly superior flavor. It also rated better in color at each evaluation except one. Differences in quality between the various individual experimental treatments within a given sugar system were not significant.—*Food Technology*, 377-80, Aug. 1955.

Ice Box Dessert Mix

A dry composition that, when mixed with a liquid, whipped and cooled, sets to the consistency of angel cake or chiffon pie filling, is the object of a recent patent.

Specifically, the mix is composed of two powders: (1) Spray dried baker's cheese containing 3% lactalbumin, dry milk, gelatin, salt, sugar and flavor such as vanilla, chocolate caramel or lime, and (2) a whipping agent and sugar. Suggested whipping agent comprises 73% dry skim milk, 15% enzyme-degraded soy protein, 6% corn starch, 2% sodium phosphate, 2% calcium citrate, 2% sodium alginate.

In preparation of the dessert, powder No. 1 is stirred with warm milk or water to obtain a thorough suspension. Powder No. 2 is stirred with cold water or milk, then whipped. No. 1 is then folded into No. 2 and the mixture stored at about 50 F. to set.—U. S. Patent 2,714,069, July 26, 1955.

Nitrogen Content of Meat

To control meat content of products such as sausage, use is made of certain numbers calculated from the analyses of fresh meats. Thus the Feder number, the ratio of water percentage to organic non-fat (approximately the same as nitrogen × 6.25) is used in Germany, and in the Netherlands the Feder number must not exceed 4.00.

In the United Kingdom the formula, % lean meat = (100/SM) × nitrogen percentage in the product, is much used. In this formula, SM is 3.4, 3.6, and 3.5 for beef or mutton, pork, and mixed meats, respectively.

Reappraisal of published data on the nitrogen composition of lean meats indicates that the figure 3.6 for pork may be too high. Careful analysis of pork carcasses for nitrogen, fat, and moisture, showed that for hogs slaughtered in the Netherlands the SM factor ranged from 3.27 to 3.62 (mean 3.40) in summer samples, 3.18 to 3.53 (mean 3.41) in winter samples. For salt pork (2.2-4.8% NaCl) the summer SM factor was 3.37, winter 3.29.

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The SM factor does not appear to be related to the feed consumed by the animals, their origin, weight at slaughter, or age. There does appear to be some variation with the breed of swine, and with fat content of the carcass.—*Journal of the Science of Food & Agriculture*, 317-23, June 1955.

Reducing pH of Wines Stops Ca Deposits

Judicious adjustment of pH in wines appears to provide a solution to the problem posed by slow precipitation of calcium tartrate in the bottled product.

Experiments on Ca stability in sherry showed that 94% of the samples contained less than 100 mg./l. Ca and that adjusting the pH to 3.59 would prevent its precipitation. A lower pH was needed for the remaining 6%. Suggested solution is blending of high Ca lots with those containing less Ca.

This method was applied to plant production over a 3-yr. period with no failures resulting. It was found that when sherries were adjusted to a pH of 3.5-3.7, depending on Ca content, Ca instability was prevented in all blends. —*Food Research*, 301-9, July-Aug. 1955.

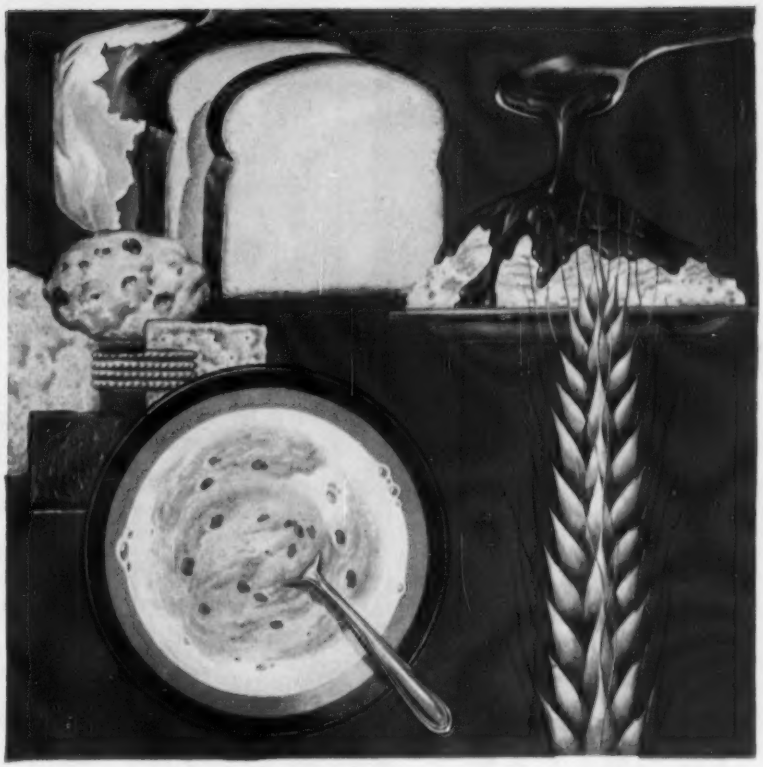
Speeding Flor-Yeast Growth

Flor sherry is produced in a particular district, Jerez de la Frontera, in Southern Spain, by a slow process in which the surface of white dry wine, stored in large casks or butts, is covered with a heavy film of a special yeast (flor yeast).

In an effort to find additives that might speed up the growth of the yeast, and thus make it more adapted to California wine-making, a large number of possible nutrients and growth factors were screened. Yeast extract caused the greatest increase in flor yeast crop, but its pronounced flavor makes it an undesirable addition.

Urea and ammonium phosphates (both mono- and di-), as well as some amino acids proved good nitrogen sources and improved the growth, and the first two should be useful since they are not expensive and present no flavor problems.

Sugars, potassium salts, and several growth factors such as inositol and biotin, did not improve growth appreciably, while a few others, including ascorbic acid, beta alanine, and riboflavin were noticably inhibitory.—*Applied Microbiology*, 3, 208-12, 1955.



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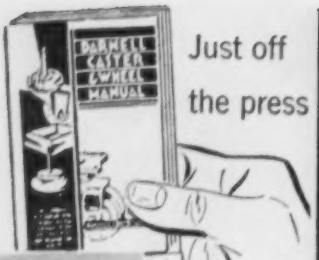

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Automatic Handlers

—*Continued from page 99*

Knapp) that assemble and deposit 12 filled quarts in a case as it is conveyed under the unit.

Supplying each caser is a 28-head Cemac (Crown Cork & Seal) filler. The filled, capped bottles are conveyed from it directly to the caser, where they are pushed onto feed chains in a predetermined pattern to form a load which is later lowered into a case.

Loading mechanism comprises a head on which is mounted 12 grippers. When a complete load is assembled, the head moves down and each gripper takes a firm hold on the neck of an individual bottle. Then the head lifts the load and moves it forward to the loading position above the empty case on the conveyor.

Cases that are conveyed from the washer are moved to the filling position under the caser by a special timing mechanism. This is integrated with the timing mechanism of the caser so that the accumulated load of filled bottles will not be lowered unless a case is in position to receive it.

After depositing its load in a case, gripper head rises, then moves back to the starting position, and filled case is discharged to an off-bearing conveyor leading to the cold room. Then another case moves into the loading position under the unit.

Saver No. 2—The Stockers

As the cases enter the cold room on conventional height conveyors, they arrive at the second labor-savers. These are two Brogdex-Neja automatic case stackers (Mojonnier Bros.).

In these units, cases are fed into a flight which then moves up and indexes the next flight to receive another case. When the desired number of cases has been assembled, the mechanism automatically reverses and forms them into a stack.

An automatic feed spaces the cases as they arrive at the stackers, and floor chains move completed stacks to conveyors that take them away.

Stackers will handle all standard type wood and metal cases from ½-pt. to ½-gal. sizes at speeds up to 20 per min. They are easily adjustable to form stacks of from 2 to 8 cases as desired.

Saver No. 3—The Floor Conveyors

Third labor saver is the floor conveyor system that starts at the stackers and runs across the cold room and out to the trailer loading-unloading platform. At the latter point, it turns a corner and follows along the retail-truck platform to the empty bottle storage and wash room, enters this room and loops past feed tables of the three soaker-washers, and then goes back to the platform (see accompanying drawing).

Two perpendicular spurs branch off the main conveyor in the cold room. They run the full length of this room and out to the retail-loading platform, where they meet the main conveyor.

This conveyor system serves three main functions:

1. Loading trailers that transport bottled milk to distributing branches.

2. Accumulating loads in the cooler for retail routes (made up at night), then moving these loads from cooler to platform.

3. Moving cases of empties from both trailer and retail loading platforms to bottle washers or storage.

Trailer facilities comprise one long platform with provision for unloading cases of empties at one end and loading stacks of filled bottles at the other. The narrow platform is at truck height, with the conveyor in its center. Platform is covered with diamond steel plates that reduce friction to a minimum, making it easy for drivers to transfer the stacks from conveyor to their trucks.

For loading into trailers, cases are stacked five high. When this operation is completed, stackers are set down a notch (4-high) and the stacks are diverted to the spurs in the cold room. Here, special areas are designated for each route truck load (see photo), and the approximate number of cases required for a load is removed from the conveyor at this point. Floor of cold room, like that of the platforms, is covered with steel plates to make the stacks slide easily.

Reverse Action

The retail truck platform is similar to trailer platform, except that it is wider. When loading begins here, case handling in the cold room is reversed. Stacks from floor areas are returned to the conveyors, which move them to the loading platform where they are transferred to the trucks.

Returning to the plant, the retail trucks back up to the platform, and the drivers remove and stack their cases, then place the stacks on the floor conveyors. Stacks then go to the empty bottle storage room and are either pulled off as a unit and stored, or broken down, with the individual cases being transferred to conventional-height conveyors that pass in front of bottle-washer feed tables.

Here, bottles are removed and the cases continue through case washers and, finally, return to the automatic case packers.

End (*Resume reading on page 101*)

Conical bottom storage bins. Field erected. Made in all metals.

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Koven

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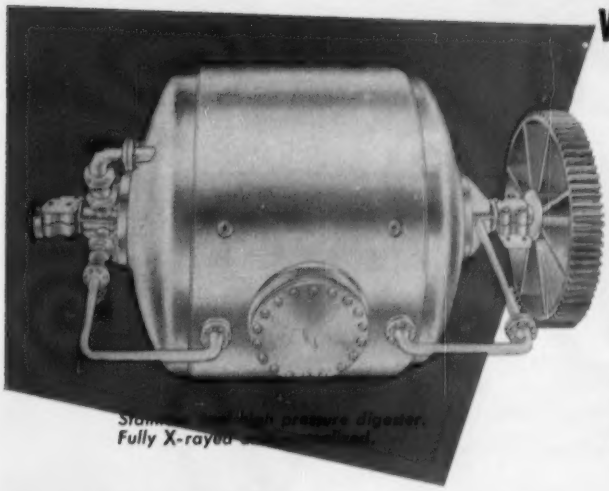

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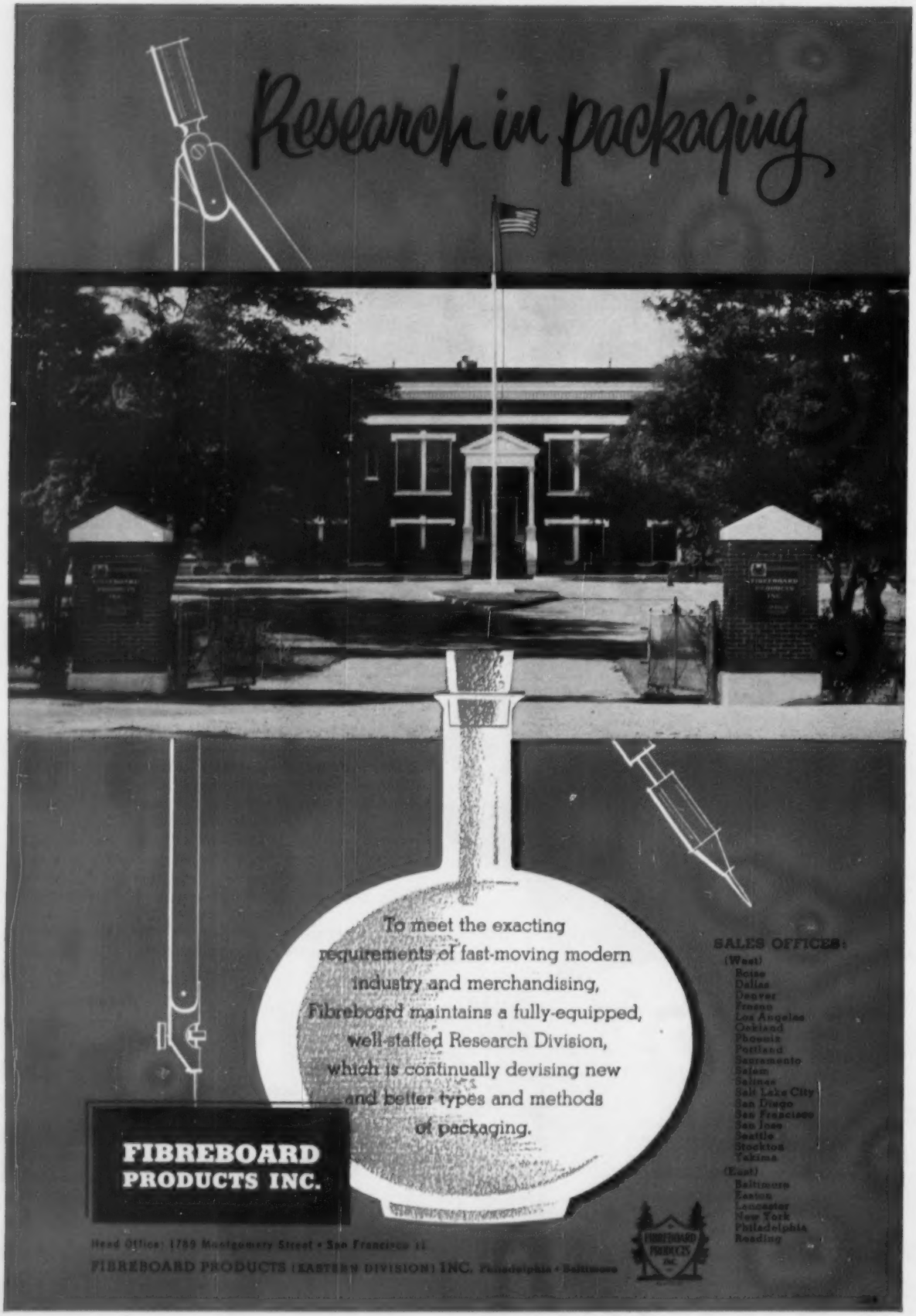
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Questions & Answers

THIS MONTH'S PROBLEM

Getting Maintenance Help

Question—We operate a food-processing establishment in a small town, located in a predominantly farming region some distance from any large industrial center. Much fine equipment is being offered to our industry, but we have hesitated to adopt much of it because of the difficulty we have in staffing our maintenance department with qualified mechanics, electricians, etc. Possibly, this is a problem common to other food plants. Could you give us some suggestions for strengthening our maintenance staff, so that we can keep pace with mechanization of the industry?

AUGUST PROBLEM

Cake Mix Formulas

Question—Could you furnish me with basic formulas for manufacturing white, yellow, gingerbread, and devil's food cakes (mixes)?

Answer—Here's a basic white cake mix formula (courtesy QMCF&CI): Cake flour, 36.0%; sugar, 43.5%; shortening (emulsifier type), 12.5%; nonfat milk solids, 3.0%; egg albumen, 2.0%; baking powder, 2.0%; salt, 1.0%; and vanilla flavor, to suit.

Yellow cake mix: Cake flour, 35.5%; sugar, 42.6%; shortening (emulsifier type), 12.5%; nonfat milk solids, 3.0%; whole egg solids, 3.6%; baking powder, 2.0%; salt, 0.8%; and lemon flavor, to suit.

Gingerbread mix: Cake flour, 32.6%; sugar, 37.5%; shortening (emulsifier type), 12.5%; molasses solids, 7.0%; nonfat milk solids, 3.0%; whole egg solids, 3.6%; baking powder, 2.0%; salt, 0.7%; cinnamon (ground), 0.4%; mace (ground), 0.2%; ginger (ground), 0.3%; and cloves (ground), 0.2%.

Devil's food cake mix: Cake flour, 29.0%; sugar, 43.3%; shortening (emulsifier type), 12.5%; Dutched cocoa, 6.0%; nonfat milk solids, 3.0%; whole egg solids, 3.6%; sodium bicarbonate, 1.0%; salt, 1.0%; and baking powder, 0.6%.

One part of mix is blended with ½ part of water.

Meat Trimming Problem

Question—Can you suggest a method of using ligaments and gristle which we trim out of the meats used for manufacturing frankfurters?

Answer—We suggest you tenderize one part of gristle and ligament for about 6 hr. in 25 parts of water. You could speed up tenderizing by pressure-cooking ¼ to 1 hr. at 15 psi.

Next, run tenderized meat through a meat grinder, using the finest plate available and very sharp knives. Collect meat in a truck and store overnight in a refrigerator. Then introduce the meat into bologna or other sausage products.

Making Potato Salad

Question—Do you have formula and directions for making potato salad that is to be packed in window-type paper cups for sale in refrigerated retail-store display cases?

Answer—Chop 4 lb. of hard boiled eggs (20 eggs). Combine with 22 lb. of cooked, cubed potatoes; 5 oz. of chopped chives; 6 lb. of diced celery; and about 7½ lb. of cooked salad dressing. Add salt and pepper to suit.

Cooked salad dressing is prepared by mixing: 5 lb. of flour, 2½ lb. of salt, ½ lb. of dry mustard, 4 lb. of sugar, and sufficient pepper and paprika to suit. Beat 16 lb. of whole eggs, and add to batch. Gradually introduce 80 lb. of milk. Cook over boiling water, with constant agitation until thick. Add 20 lb. of vinegar and 10 lb. of butter or margarine. Cover and cool.

You might wish to add to the potato salad about 2 lb. of finely chopped raw carrots or pimiento.

Re Stainless Steel Units

Question—Last year, we installed a considerable amount of new stainless steel equipment—kettles, pipelines, pumps, etc.—in our cannery. We expected the stainless would give us years of corrosion-free service. However, we have already been disturbed to find evidence of pitting in several of the kettles. Can you suggest what may be wrong? And what can we do to control this condition?

Answer—Because stainless steel is so corrosion-resistant, it is sometimes given less attention than it would otherwise get. It does require proper care if it is to give maximum service. Its corrosion resistance is caused by the very resistant film that forms on the surface through the action of oxygen. Therefore, anything that cuts off the oxygen will weaken the film and corrosion resistance.

One of the commonest sources of trouble is in incomplete cleaning of the equipment taken out of service. Food deposits that may have been left on the surfaces might become moist, and pit-type corrosion would then be apt to occur under them. This would most likely occur in the most inaccessible portions of the equipment, or in any rough spots, such as incompletely polished welds.

The solution would be to make sure that the equipment is thoroughly cleaned of all adhering food deposits immediately after use. First thoroughly flush, then use cleanser with high alkaline or phosphate factor. If necessary, use an acid-type remover followed by an alkaline flush. Special attention should be given to seams, joints, etc.

Another possible cause of the pitting you have observed would be incorrect selection of the type of stainless steel. It is known that certain food ingredients, such as brines or combinations of acids and salts, pit some types of stainless steel.

For such use, type 316 (containing molybdenum) is recommended. Manufacturers of stainless steels assert that the resistance of stainless surfaces to corrosion can be increased by flooding them with aerated water, nitric acid solution, or perborate—all

Q.—Why is it that sometimes white spots form on our oil-roasted, salted nuts?

A.—You are probably using a very fine salt. Employ, instead, a medium grained salt. Coarse grained salts, too, will give you trouble, since they will not adhere well to the nuts.

How Would You Do It?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published with credit (unless you specify otherwise.) We pay space rates.

What is *Your* Problem?

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

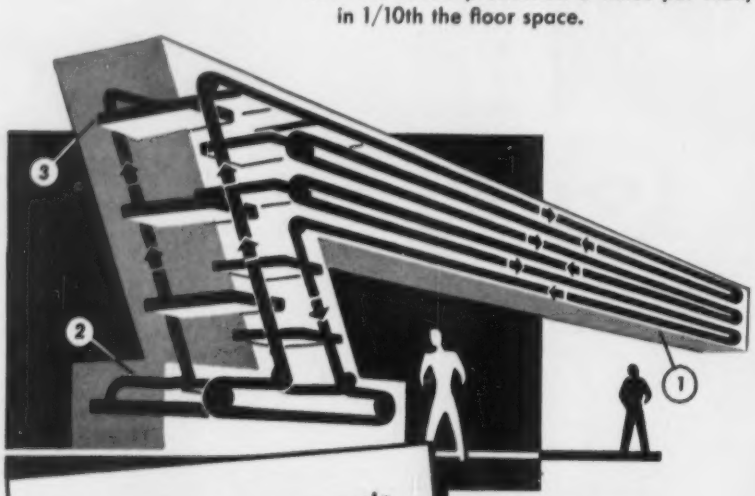
Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

Are your products Cooled, Heated or Dried?

Make new **PROFITS** from unused overhead space while processing your products under exact time, temperature, and atmospheric **CONTROL**

. . . with a GREER MULTI-TIER

Converts heating, cooling, drying and similar operations from batch to continuous processing. In one application alone, MULTI-TIERS have increased production 5 times per man, in 1/10th the floor space.



① Saves floor space—ample headroom.

② Multi-Tier trays convey products through controlled processing cycles of 10 minutes to 10 hours without jar or jolt. Automatic or manual loading and unloading.

③ Trays always perfectly level—custom fitted to your product.

FREE

New 8-page bulletin tells how a MULTI-TIER can probably save you time, labor and floor space. Send for your copy.

J. W. GREER COMPANY

Wilmington, Massachusetts

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of which increase the amount of oxygen contacting with the surfaces.

One further possible cause of pitting might be the use of a sterilizing solution which has left a film of hypochlorite on the metal. This difficulty can be overcome by using a solution in which all the chlorine is available—i.e. goes into solution, so that it can be thoroughly rinsed off.

One final possibility might be rust dropping into the stainless equipment as, for example, from overhead piping. Should this occur, the spot should be removed by scouring with a fine abrasive (such as Bon Ami), or burnishing with fine *stainless steel wool*. Following this, the treated surface should be "passivated" by washing with warm 20-30% nitric acid solution.

Anent Salmon Caviar Spread

Question—Recently, I picked up a 2⅛-oz. jar of a smoked-salmon caviar spread. Have you any information on how I can prepare this product?

Answer—Since we do not have a sample of the particular spread you mentioned, it would be impossible for us to supply you with the exact formula.

However, the Fishery Products Laboratory, Ketchikan, Alaska, which is operated by the Alaskan Fisheries Experimental Commission and U. S. Fish and Wildlife Service, has carried out some experimental packs. Product was creamy, smooth-textured, and had a bright reddish-orange color.

Here's how they prepared the spread:

Skeins of chum-salmon eggs were immersed in 95-deg. salometer brine (2.8 lb. of salt per gallon of water) for 25 min. Drained, brined eggs were loaded onto smoking trays covered with greased aluminum foil. Eggs were then smoked 2½ hr. at 115-120 F.

The eggs were next removed from smokehouse and cooled. They were ground into a slurry by a hand-operated, corn-milling-type grinder, and strained through a 16-mesh screen.

To 4.5 lb. of the strained liquor

Q.—How can we prevent separation of chicken fat from seasonings in our chicken-soup base?

A.—The melting point of chicken fat is low. And it is for this reason that it separates from the seasoning. Solution to your problem is to mix a higher melting-point fat—like Crisco—with your chicken fat. You might start with 50% chicken fat and 50% hydrogenated fat. You may even want to add less chicken fat.

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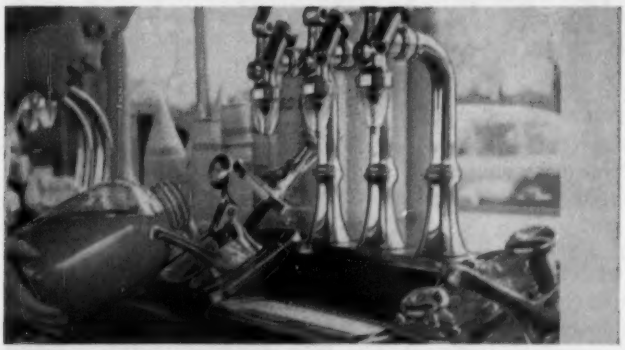

. . . to help you improve food flavors and extracts, flavor concentrates and food colors

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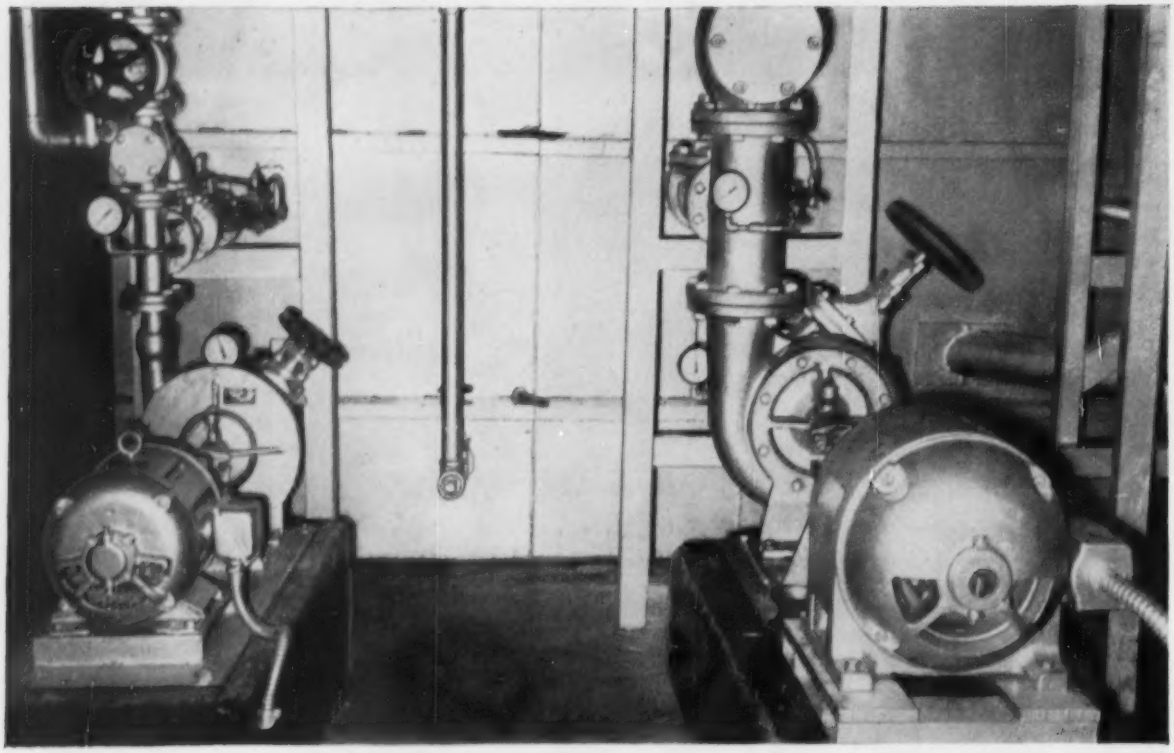

What special features make Gardner-Denver centrifugals the better choice?

Water friction inside a pump can rob you of power and efficiency—and that costs money. That's why Gardner-Denver takes special precautions to design interior passageways that are extremely smooth—that guide water through the pump with a minimum of turbulence.

A skimpy pump will wear itself out long before it should. That's why Gardner-Denver pumps are provided with sturdy bases that give rigid support—extra-sized shafts of high carbon alloy steel—heavy-duty roller bearings.

Write for descriptive bulletins.

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Gardner-Denver Company, Quincy, Illinois
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were added 0.23 lb. of salt, 3 tsp. of garlic salt, and 1 tsp. of pepper sauce.

Mixed ingredients were poured into 2⅜-oz. jars. Rubber gasket lids were applied, and the jars were immersed for 1 hr. in a 197-deg. F. water bath.

Lighting for Inspection Belts

Question—May we have suggestions on the best lighting for olive inspecting and sorting belts, and also place-packing of olives into jars?

Answer—Illumination of approximately 100 footcandles on the sorting and inspection belt is recommended. White or daylight fluorescent lamps may be used, for these have been found to be superior to colored light where differentiating slight color differences are involved.

Light fixtures should, of course, be mounted above the belt in such a way that they cannot cause direct glare into the employees' eyes. They must, therefore, be either suspended below the average eye level or, if higher, be fitted with louvers having proper cut-off—for example, 35 degrees if suspended about 3 ft. above the belt.

It is also necessary to bear in mind that very annoying glare can be reflected from wet surfaces. For this reason, lights should be selected that have low brightness. Types should be fitted with diffusing covers or "egg crate" louvres. It is advantageous to use lights fitted with glass plates covering the lower surfaces, so that dirt can be readily washed off and the lights thereby restored to their initial efficiency.

For the place-packing operation, very much the same considerations will hold true, except that an intensity of 50 footcandles at the working level is adequate.

Additional detailed information on lighting for these purposes is available from the Illuminating Engineering Society publication "Lighting for Canneries."

Q.—Do you have any information on a German test-development whereby, through the use of glass slides and a microscope, one can detect how long a bread dough has been mixed.

A.—We have no information other than that dough on a glass slide is yellow-stained with a special technique. Stained slide is then examined under a microscope with ultra-violet light to determine how gluten in the dough has developed and, thereby, determining if the dough is under- or over-mixed.

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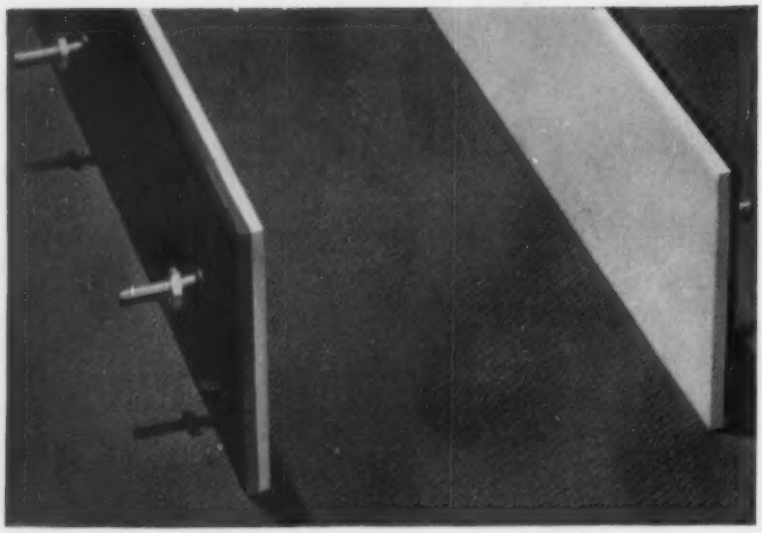

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USG

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Representatives in principal cities throughout the world

Making Blue Cheese Dressing

Question—Can you provide me with a formula for preparing a blue cheese dressing?

Answer—A sweet-sour oil dressing containing blue or Roquefort cheese can be made up from the following formula:

Salad oil, 130 parts; vinegar (40 grain cider), 70 parts; water, 30 parts; salt, 8 parts; sugar, 1 part; garlic powder, ¼ part; black pepper (fine grind), ¾ part; monosodium glutamate, ½ part; celery (sugar base), 1 part; parsley (fine grind), ¼ part; blue or Roquefort cheese, optional 30 to 40 parts.

This is a separating type dressing. Garlic powder should be rehydrated in water before combining with other ingredients. Cheese should be added last.

Fermenting Mustard

Question—We've been running into a problem with our prepared mustard—bubbles forming in the product several days after packing. Do you know how these bubbles are formed and how we can avoid them?

Answer—It appears to us that bacteria—*B. Mesentericus, B. vulgatus,* or *B. vulgaris*—are responsible.

We suggest you do one of two things:

1. Dry heat the mustard seeds at 170 F. to destroy these organisms.
2. Pasteurize the jar-packed product, say 30 min. at 150 F. for a 6-oz. jar.

A La King Formulas

Question—Do you have formulas and directions for preparing chicken, ham, and veal a la king that are to be packed in 12-oz. cartons and then frozen?

Answer—Simmer 25 lb. of diced chicken or cubed ham or veal in steam-jacketed kettle. Drain and save liquid.

Cook in kettle until tender: Chopped onions, 1½ lb.; diced mushrooms, 4 lb.; diced celery, 2 lb.; chopped green peppers, 2 lb.; finely cut pimientos, 1 lb.; and drippings, 2 lb. Now remove vegetables.

Prepare sauce from drippings drained from vegetables: Flour, 1½ lb.; nonfat milk solids, 3 lb.; salt, ¾ lb.; ground pepper, 1 oz.; and broth from meats, 24 lb.

Add to sauce; meat (chicken, ham, or veal), 25 lb.; cooked vegetables; sliced boiled eggs, 5 lb.; and tabasco sauce, to suit. Package and freeze.

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99+% Pure Mono Sodium Glutamate Crystals

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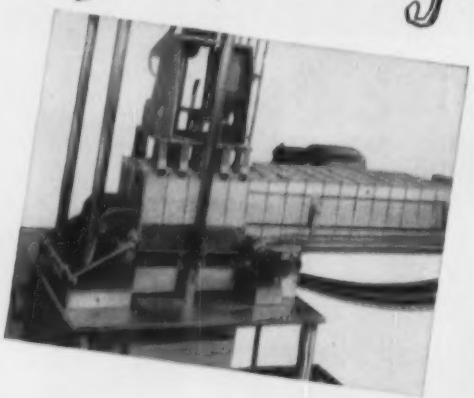
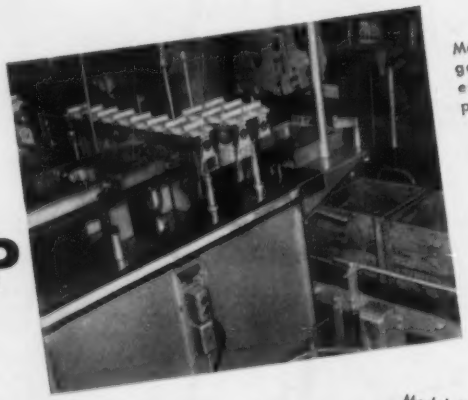


Model 836 high speed caser for flat-top or gable-top fibre containers in quart, pint and ½-pint sizes.



Model 834 for flat-top or gable-top fibre containers in ½-gallon, quart, pint and ½-pint sizes.

AUTOMATIC CASING ON STANDARD-KNAPP EQUIPMENT

If you are using manual casing, compare your methods and costs with dairies employing Standard-Knapp automatic equipment.

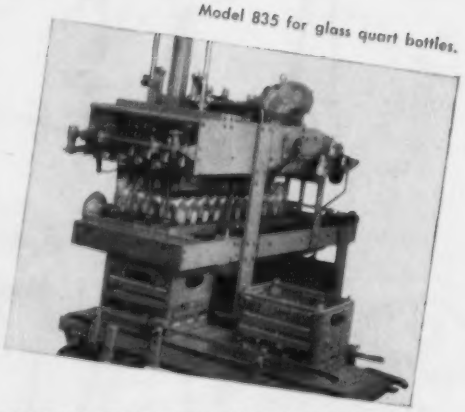
FIRST, IN SPEED — One automatic caser will load up to 12 cases per minute.

SECOND, IN PERSONNEL — As machine is automatic, manual assistance is not required. Valuable personnel are freed for more important tasks.

THIRD, IN DAMAGE TO CONTAINERS — The automatic caser does not tire. It lowers the carton gently into the cases with uniform smoothness at all times.

You no longer need or should pay the high cost of manual casing. *For the complete story, ask to see one of our representatives. For more details, write for our bulletins on AUTOMATIC MILK CASERS.*

Model 835 for glass quart bottles.



so smooth . . . so quick . . . it's PACKAGING MAGIC

STANDARD-KNAPP *DIVISION OF EMHART MFG. CO.* **PORTLAND, CONNECTICUT**

Painting a Bakery

Question—We plan to paint the entire interior of our bakery and all of our equipment. We wonder, therefore, if it is feasible to carry out a project on dynamic painting—coating various parts of the equipment with different colored paints to set them apart. When this idea was checked into several years ago, the feeling seemed to be that it was impractical for a bakery because of the thin layer of flour dust likely to accumulate on painted surfaces. Do you know if anything has been done toward use of such a painting scheme?

Answer—To carry out a functional color program, a survey must be made to fit specific conditions, particularly lighting (natural and artificial) in a bakery.

Gloss finishes are generally recommended for walls, ceilings, and dadoes because they withstand thorough, routine clean-up operations. These finishes are more resistant to mildew, and don't tend to collect dust or dirt.

And, despite causing a certain amount of glare and objectionable highlights, they stand up better than flats or semi-gloss finishes when subjected to washing or damp-dusting.

A gloss white is recommended for ceilings to assure greatest utilization of light. Dark shades should be employed for frequently washed inside window sills and radiator covers as well as baseboards, doors, and door frames. However, dark shades should not be used on other interior trim to avoid excessive contrast.

Other than ceilings and trimmings, here are colors suggested for specific production areas:

Flour storage and blending—Upper walls, white; dado and doors, medium green; blender, light gray; skids, "high-visibility" yellow; and controls, "precaution" blue. The green and white combination promote good visibility and provide "coolness" in this area.

Dough mixing—Upper walls, light green; dado and doors, medium green; mixers, "spotlight" buff; monorails and dough troughs, light gray; controls, blue; and gauges, yellow. The green combination has a cooling effect and creates a clean, attractive appearance.

Q.—Do you have instructions for making tartar sauce?

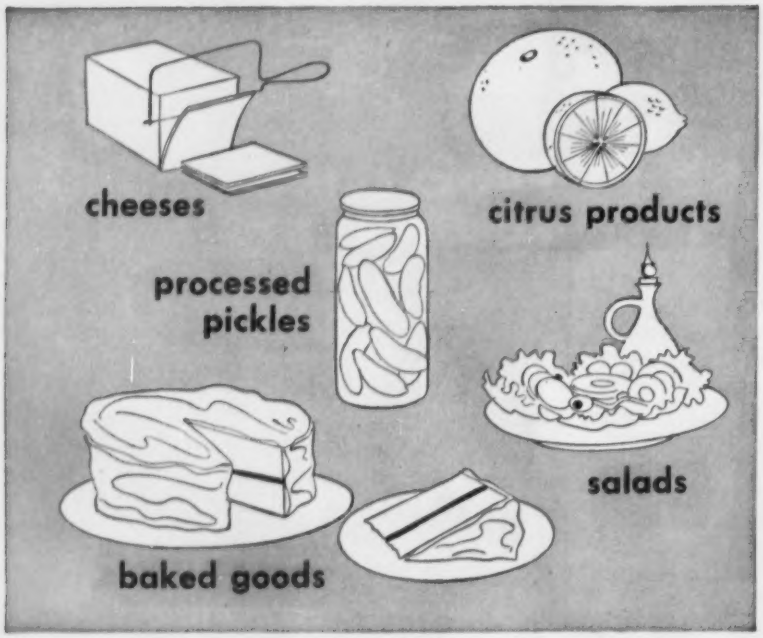
A.—To 50 gal. of mayonnaise, add the following finely chopped vegetables: Olives, 17½ lb.; parsley, 17½ lb.; pickles, 17½ lb.; capers, 17½ lb.; and onions, 15 lb. Blend well, fill into jars, cap and label.

For more information, use coupon on last page.

CARBIDE is the source for

SORBIC*

a ***NEW*** *selective food fungistat for . . .*



- Sorbic can be used with confidence at required levels—it is metabolized like fatty acids in foods.
- Sorbic controls growth of many undesirable microorganisms in foods.
- Sorbic can be so used that it permits the growth of many of the desirable organisms.
- Sorbic contributes no flavor at required concentrations in foods so far tested.

For further information write the CARBIDE office nearest you for technical bulletin F-6568. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto.

* CARBIDE's *refined sorbic acid for use in foods.*

CARBIDE and CARBON CHEMICALS COMPANY
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

Fermenting—Upper wall, light green; dado and doors, medium green; dough troughs, light gray; and guards, yellow. The two-tone green combination provides a cooling effect in this high temperature-humidity area.

Dough make-up—Upper walls, ivory; dado and doors, medium blue; equipment and cabinets, light gray; and controls, blue. Ivory provides a slight contrast with formed loaves, and blue has a cooling effect.

Bread oven—Upper walls, ivory; dado and doors, medium blue; ovens, baked white enamel with stainless steel strips; monorails, light gray; and controls, blue. Light blue might be used for upper walls.

Bread slicing and wrapping—Upper walls, ivory; dado and doors, medium blue; wrapping machines, green; other equipment, light gray; and controls, blue. Green wrapping machines and golden loaves are pleasantly contrasty.

Rolls—Upper walls, ivory; dado and doors, medium blue; equipment, light gray; and controls, blue.

Cake mixing—Walls, light green; trim and doors, medium green; equipment, buff; and controls, blue.

Cake baking—Upper walls, light blue; dado and doors, medium blue; oven front and equipment, light gray.

Cake icing—Upper walls, light green; dado and doors, medium green; equipment, spotlight green.

Cake wrapping—Upper walls, peach; dado and doors, light blue; wrapping machine, spotlight green; doorways and bumper guards, yellow and black.

For professional, specific suggestions on the adoption of a functional color program, you might contact manufacturers of paints and enamels.

Potato Puff Formula

Question—Do you have directions for manufacturing frozen potato puffs?

Answer—Here's a basic formula that you can modify to suit your taste: Cooked, peeled potatoes, 79.50%; butter or margarine, 4.50%; cream (light), 9.00%; egg yolks, 3.50%; and egg whites, 3.50%.

Now as to preparing the potato puffs.

Whip peeled, boiled potatoes until free of lumps in beater-type mixer. Beat in butter and cream until batch is fluffy. Add well-beaten egg yolks, and then fold in stiffly beaten egg whites.

Form into 1½ to 2-in. dia. balls, place on greased bake sheets, brush with melted butter, and bake 15-20 min. in 375-F. oven. Pack cooked, cooled potato balls into consumer-size cartons, and finally freeze.

Perfect Partners for Modern Materials Handling—

Modern White Trucks

VOLUME distribution and split-penny profits call for the most economical . . . most efficient trucks.

That's why White Trucks are the choice in so many businesses.

Whites are engineered to exact operating conditions to get more work done, in less time. They save time on the road, save time making deliveries. And they're powered for big payloads and tight schedules, too.

Find out how Whites fit into your distribution program—you'll find Whites are perfect partners for today's way of doing business.

"Whites Help Reduce Our Delivery Costs"

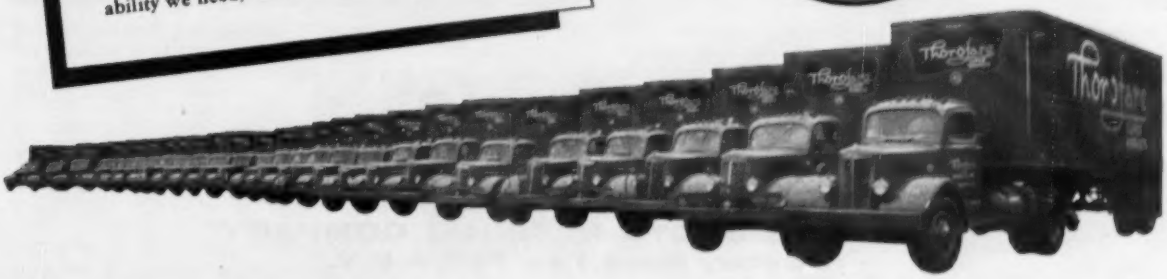
. . . N. A. McAleese
Director of Distribution Center
Thorofare Markets, Inc.
Pittsburgh, Pa.

Matching the modern efficiency of Thorofare Markets' new distribution center at Murrysville, Pa., is the fleet of White Trucks hauling 2030 tons of food products a week, servicing 62 stores. "We're scheduling nearly 150 loads a week and constantly increasing payloads and miles. Yet our Whites continue to give us the kind of dependability we need," Mr. McAleese says.

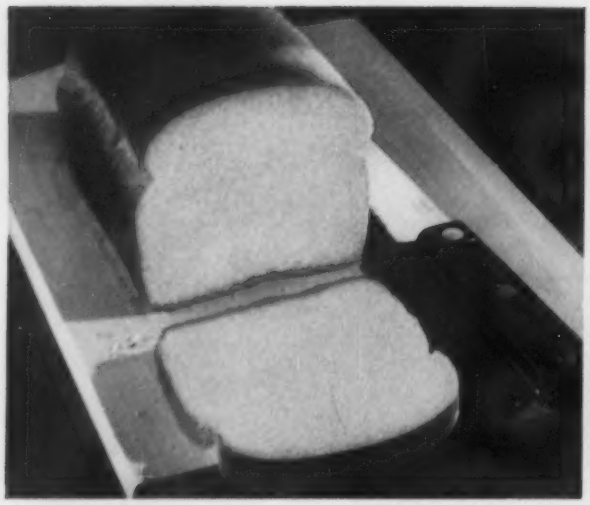
THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

FOR MORE THAN 50 YEARS
THE GREATEST NAME IN TRUCKS

White



For more information, use coupon on last page.



Sugar is the key to wheat flavor in bread. And of the basic sugars that nature provides, many bakers have discovered that Cerelose brand dextrose—the sugar made from corn—produces more of the finer flavor overtones in baked bread than any other sugar.

Preserving the piquant flavor of tomato products, Cerelose brand dextrose is a reducing sugar that will not mask delicate spice flavors with sweetness. Also, by retarding oxidation, Cerelose increases the shelf life of the natural red tomato color.

To boost flavor...without over-sweetness... more and more food processors are using

CERELOSE®
BRAND DEXTROSE

THE SPECIAL SUGAR THAT DOES SPECIAL THINGS FOR FLAVOR IN FOODS

All too frequently, true fruit flavor is masked by the sweeteners in the preserving syrup. When syrup concentrations must be increased to prevent bacterial spoilage and retain the fruit's fine texture, Cerelose brand dextrose sugar is used to protect the flavor . . . without over-sweetness.

Cerelose brand dextrose sugar is more than just a sweetener here. It accentuates the presence of butterfat to produce the kind of richness Americans like in ice cream. Also, in sherbets and ices, Cerelose allows the manufacturer to increase body without increasing sweetness.

Our technical staff welcomes the opportunity to show you why you should use Cerelose brand dextrose sugar in your formula. Call us today.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York 4, N. Y.

About the Khapra Beetle

Question—Do you have any information on how to identify and control the Khapra beetle?

Answer—We suggest you write the USDA for its excellent leaflet entitled, "Have You See This in Your Grain?" It illustrates where and how to check for these new-to-the- U. S. A. destructive grain pests. And, if you still are unable to identify these beetles, instructions are given for proper packing and mailing of dead specimens to: Insect Identification and Parasite Introduction Section, ARS, USDA, Beltsville, Md.

The government is doing all it can to check this pest before it spreads from the Federal-quarantined states Arizona, California, and New Mexico to grain-producing areas.

This insect belongs to the same family as the carpet beetle. It is usually first noticed because of the presence of its fuzzy larvae, or their cast skins in clusters around the corners of grain-storage bins, or in used sacks.

Khapra beetles are extremely difficult to control. Little success has been recorded, to date, in eliminating this insect from premises that have become infested. As a matter of fact, several Khapra-beetle infested warehouses were thought to be entirely free of infestation after 3-4 thorough sprayings. But the following spring, they were found heavily infested.

As far as we know, normal control measures—except for resorting to costly plastic tarpaulin fumigation—have not eradicated the pest from infested buildings nor have they removed the hazard of spread.

It is reported that the larvae are resistant to most residual insecticides. But these insecticides effectively kill the insect on direct contact.

Treatment may vary. Required may be general fumigation of an entire building, fumigation with forced circulation, partial fumigation and spraying, spot fumigation, etc.

Anyway, we'd suggest you contact a professional sanitation consultant because of the complex problems and costly remedial measures involved with potential Khapra beetle infestation.

Q.—How'll I make shrimp patties that are to be packaged frozen?

A.—Run 15 lb. of raw peeled shrimp through a grinder with a ½-in. plate. Mix thoroughly with ½ doz. eggs, ¾ lb. of potato flour, 2¼ oz. of salt, and ¼ oz. of white pepper. Chill batch to 38 F. and mechanically form into 2-oz. patties in molding machine.

...AND *Automatically* YOUR PRODUCT IS PACKAGE-WRAPPED AT *3 to 5 units per second!*

Unbelievable savings in time, labor and materials are yours with the Campbell Wrapper. Automatic continuous feeds and deliveries combined with easy, simple operation permits one person to tend and operate several machines at one time in many cases. Then too, because no trays or stiffeners are required *unless desired,* you cut material costs from 25 to 50%. With the Campbell Wrapper packaging production soars to new heights too, for it automatically crimps, heat or glue seals your products, in any type wrap material, at average speeds of *100 to 300 units per minute!* Wraps regular or irregular shaped products — single or multiple per unit with equal ease and speed. Simplified adjustments require minimum down-time for size change-over. Whatever your product—investigate now, how you can *save* with the Campbell Wrapper.

WHAT'S YOUR PROBLEM?

Send us a sample product—our packaging engineers will gladly advise you how the Campbell Wrapper can fit your needs. There's no obligation, of course.

New! Completely revised free booklet—Write for your copy.

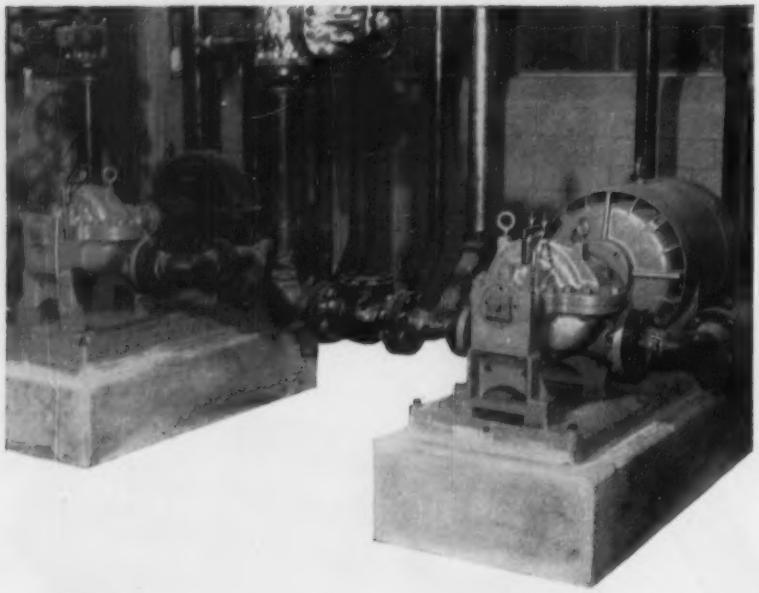
Campbell WRAPPER

HUDSON-SHARP MACHINE CO. • GREEN BAY, WIS.

Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Crepers and Tissue Converting Units.

NEW YORK: 55 WEST 42 STREET

For more information, use coupon on last page.



Two Goulds 2 x 3—9 Fig. 3305 two-stage centrifugal pumps on boiler feed service. These pumps are available in five sizes with capacities to 1200 GPM, heads to 1000 ft.

7 *design features*

improve pump operating efficiency

Every one of these features is *standard* with this new Goulds Fig. 3305 two-stage centrifugal pump:

1. **Renewable stuffing box bushings.**
2. **Bearing housings sealed against moisture and dirt.**
3. **Cowl-type glands suitable for use with quenching liquids.**
4. **Stainless steel impeller keys**
5. **Teflon water-seal rings.**
6. **Die-formed stuffing box packing.**
7. **Corrosion-resistant gland bolts.**

Together, these seven construction features give you, without extra cost, a quality of service that's unique in general liquid-handling pumps.

The Fig. 3305 offers other advantages, too. For example, you can choose either a conventional stuffing box or a mechanical seal—and change from one to the other at any time. Also, extensive interchangeability of parts helps keep your parts inventory low.

Bulletin 722.6 gives the complete story of Fig. 3305 advantages, including specifications, performance curves, and interchangeability charts. Write for a copy.

Goulds PUMPS INC. Seneca Falls New York

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURG • TULSA

Better Spot-Fumigation

—*Continued from page 64*

holes—one in the head and one in each of the two legs, at locations convenient to the operator.

Since both machinery and other facilities are treated, the mill building is extensively ventilated. And since the majority of points of application are on the top floor, this area is kept well ventilated.

Starting on the fourth floor, operators fumigate 150 elevator boots. Treated on the fifth floor are 120 roll stands (two pair of rolls per stand), each getting two 2-oz. shots. And on the sixth floor, ten automatic scales each get a shot and two bran dusters receive two shots each.

Four bran dusters on the seventh floor get single shots. Given four shots each on the eighth floor are 26 sifters. Finally covered on the ninth floor are legs and heads of 150 elevators, 7 suction lines to dusters, and 7 sifters (4 shots each).

Also fumigated when empty are 37 bulk bins (1,800-cwt. capacity each) on the "finished" floor. Bins are treated, in this case, for an 18-hr. period with a space fumigant.

End (*Resume reading on page 65*)

Cues From the Courts

—*Continued from page 79*

advertised products with the phrases "Pep up your blood" and "A tonic for your blood."

The Commission found, however, that the products had no beneficial effect upon the blood except in cases of simple iron-deficiency anemia. And so it held that the maker must include in its advertisements a statement that the products generally will not be effective in relieving or correcting blood diseases.

Yet the higher court held that the manufacturer need not include this statement in its advertisements, saying:

"The question before us deals with an advertiser who states plainly that his product will aid a certain condition when that condition arises from one certain described cause. The Commission requires that the advertiser tell the public that his product is more frequently valueless than it is valuable.

"Even if we give effect to the broadest possible concept of the power conferred by the Congress upon the Commission, we do not think that the Commission has the power here claimed. There is a limit to the Commission's power."

End (*Resume reading on page 80*)

Want to get un-stuck on production difficulties?

DU PONT INDUSTRIAL COATED FABRICS

E. I. du Pont de Nemours & Company (Inc.)
Fairfield, Conn.

COATINGS OF

Silicone rubber • Neoprene • Buna N • GR-S

ON THESE FABRICS

Nylon • "Dacron"† • Glass
Cotton • "Orlon"‡ • Asbestos

Glass fabrics coated with "Teflon" tetrafluoroethylene resin, elastomer sheet stocks and cements

†Du Pont's trade-mark for its polyester fiber.
‡Du Pont's trade-mark for its acrylic fiber.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

There are times when a product should *lose* its grip—improved "release," they call it. Take the case of electric irons used to heat-seal plastic films. Technicians of the Du Pont Fabrics Division suggested a *coated fabric* that proved ideal for covering the heating elements. It had the necessary heat resistance plus excellent "release"—no sticking whatsoever.

If you need a special gasket, seal, diaphragm or protective cloth material in your design—why not try a Du Pont coated fabric or sheet stock? You can obtain the exact combination of properties you need with the proper fabric and coating. Heat resistance with good "release," abrasion resistance with superior flexibility, oil resistance with high strength—these and many more combinations are possible.

We'll be glad to discuss possible application of coated fabrics in your design or on your equipment. Just clip and mail coupon for further information.

E. I. du Pont de Nemours & Co. (Inc.)
Fabrics Division, F-510, Fairfield, Conn.

I am interested in Fairprene Industrial Products.

( ) Have a representative call. ( ) Send further information.

Name_____ Title_____

Firm_____

Address_____

City_____ State_____

For more information, use coupon on last page.

Useful New Books & Government Publications

Manual for Bakers

A NEW TREATISE ON PIES *Published by Technical Service Dept., American Maize Products Co., 250 Park Ave., New York City 17. 1955. 80 pages. 8¼ x 11 in., paper. Price: $2.50.*

This formula book covers the "why" as well as the "how" of pie baking. It is the third edition of the reference work, combining scientific fact and rule with the intangible factors that contribute to the baking "art".

The book is divided into three sections—pie crusts, fillings, and formulas—with an appendix which deals with such subjects as pie faults and the cures, and frozen pie production.

Every other page in the book has been left blank for notes and comments.

Cold Sterilization Guides

Prepared by Quartermaster Food and Container Institute of the Armed Forces, a four volume bibliographical series has just been released to industry by the Office of Technical Services, U. S. Department of Commerce. All may be ordered from the Department at Washington 25, D. C.

RADIATION STERILIZATION — REVIEW OF LITERATURE IN SELECTED FIELDS (PB 111634). 77 pages. Price: $2. Research in fields of proteins, lipids, carbohydrates, meats, vitamins, and enzymes.

BIBLIOGRAPHY ON IONIZING RADIATIONS, PART I (PB 111635). 266 pages. Price: $6.75. BIBLIOGRAPHY ON IONIZING RADIATIONS, PART II (PB 111636). 320 pages. Price: $8. Over 4,500 references with journal titles listed in full.

SUBJECT INDEX ON IONIZING RADIATIONS, PART III (PB 111637). 281 pages. Price: $7.25. Subject index to bibliography.

Books for Brewers

BOTTLING AND CANNING OF BEER *By Donald G. Ruff and Kurt Becker. Published by Siebel Publishing Co., 4055 W. Peterson Ave., Chicago 30. 1955. 209 pages. 8½ x 11¼ in., cloth. Price: $10.*

Written to provide a quick and accurate reference for master brewers, chemists, foremen, and brewery management, book was formerly used exclusively as a text in the Brewing Technology Course at Siebel Institute, Chicago. The past five years have been spent revising it and incorporating the latest information on beer packaging.

It is profusely illustrated with colorful photographs, sketches, charts, and foldout cross-sectional diagrams of leading bottling equipment. Chapter topics include bottles, bottle cleaning, bottle washing compounds and their characteristics, beer handling, instrumentation in the bottling plant, filling and beer fillers, crowns and crowning, pasteurization, labels and labeling, canning and packing of beer, and quality control in beer packaging.

Mr. Ruff is technical director of the Blatz Brewing Co., and Mr. Becker is vice-president and dean of the Siebel Institute.

BREWING INDUSTRY SURVEY *Published by Research Corp. of America, 570 Fifth Ave., New York City 36. 1955. 144 pages. 8½ x 11 in., cloth (ring-bound). Price: $40.*

This fourteenth annual edition presents the latest facts and figures on beer and brewers in the United States, covering the period 1950-1954.

Data is included on sales and consumption of beer, brewers sales, profits, and working capital, and Canadian and Mexican brewing. An added feature is a complete personnel directory.

Metal Protection Guide

PROTECTIVE COATINGS FOR METALS. *Second Edition. By R. M. Burns and W. W. Bradley. Published by Reinhold Publishing Corp., 430 Park Ave., New York City 22. 1955. 6¼ x 9¼ in., cloth. Price: $12.00.*

Enlarged and almost completely rewritten, this book is of value to chemists and engineers concerned with metal protection. Presenting data on the composition, properties, and performance of both metallic and organic coatings, the work brings the reader up-to-date on corrosion inhibitors, chemical conversion coatings and sprayed metal coatings. Book is illustrated and indexed.

Preventing Skin Diseases

THE PREVENTION OF OCCUPATIONAL SKIN DISEASES. *Published by Assn. of American Soap & Glycerine Producers, Inc., 295 Madison Ave., New York City 17. 1955. 42 pages. 6 x 9 in., paper. No charge.*

Directed at educating industry in the conditions which cause skin troubles and how they may be prevented, this booklet is of definite interest to members of the food industry. Candy processors, for example should beware of the skin sensitizing effect of chocolate. Canners should know that certain acids used in their branch of the industry may cause skin irritations.

Chapters are presented on inci-

FE REPRINTS AVAILABLE

Difficult-to-find practical information on food plant operations and materials is available in the "roundup" reports and articles listed below. Single-copy reprint prices are given. For orders of 20 or more, there is a 25% discount. You order the reprints by circling the corresponding numbers on the Reader Service Coupon, inside the back cover. You will be billed when your order is filled.

8. Newer Ingredients $1.25

Twenty-page report on the newer ingredients which aid in producing better food products (May, 1952). It includes detailed articles on these subjects: (1) Guide to Optional "Chemical" Additives. (2) Antioxidants Provide New Flavor Controls. (3) Industrial Enzymes Now Speed Natural Processes. (4) Food Emulsifiers Bring New Highs in Uniformity. (5) Seaweed Extractives Find Versatile Uses in Foods.

9. Vacuum Cooling $0.75

Eight-page special report covering the use of efficient vacuum cooling in a wide variety of food processing operations to save costly process time, reduce labor, increase output, and avoid spoilage losses (October, 1952). Performance data for specific types of applications are presented in this engineering study.

10. Packaging Materials $1.00

Sixteen-page report on how to get better production-line performance with packaging materials and containers (March, 1952). It includes these comprehensive articles: (1) Developing Your Package for High Output. (2) How Properties of Materials Affect Packaging Speeds. (3) Nipping Production Slowdowns by Pre-Checking Supplies. (4) Tips on Ordering Materials for Top Performance. (5) Proper Storage of Your Stock Averts Line Headaches.

11. Sanitation $0.50

Six-page report on "How To Assure Top Sanitation in Your Processing Equipment" (Jan., 1952). This report was a preprint of one section of a practical book on food plant sanitation prepared by Association of Food Industry Sanitarians.

12. Materials Handling $1.00

Twelve-page report entitled "How Modern Materials Handling Gives New Spurt in Processing" (March, 1951). Case histories of important savings through more efficient handling are presented. And the different types of handling equipment are described and illustrated.

13. Mixing $0.50

Four-page roundup of progress in plant mixing methods and equipment, plus a forecast of what is ahead (Oct., 1953). Performance data are included as yardsticks of what can be achieved.

14. Aseptic Canning $0.75

Eight pages, including foldout picture flowsheet, describe, evaluate, and illustrate in detail the continuous, short-time, high-temperature aseptic canning process that won the 1951 Food Engineering Award. (June, 1951).

Makers of salad dressing need '999'

So do makers and processors of beer . . . candy . . . canned foods . . . cereals . . . malted milk . . . margarine . . . mayonnaise . . . meats . . . olives . . . sauerkraut . . .

Morton '999' Salt
for better flavor and quality

Morton '999' Salt insures uniform flavor and quality in processed foods for two reasons:

1. Morton '999' is *guaranteed* always to contain more than 99.9% pure sodium chloride. The remaining 0.1% (or less) is a neutral inert sodium salt—and never bitter calcium or magnesium compounds.

2. Morton '999' Salt is produced by vacuum pan evaporation to assure you a salt that is clean, free-flowing... evenly soluble. '999' Salt is particularly low in objectionable trace metals.

For more information about Morton '999' Salt—and about Morton service and technical help—write this week to:

MORTON SALT COMPANY
Industrial Division, Department E 7-10
120 South La Salle Street, Chicago 3, Illinois

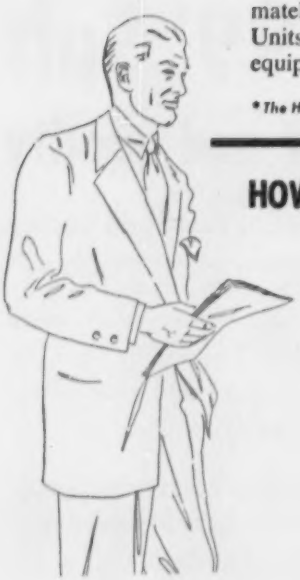
For more information, use coupon on last page.

Re: Roberts Manufacturing Co.,
Cleburne, Texas

NO DAMAGE CLAIMS IN 7 YEARS*

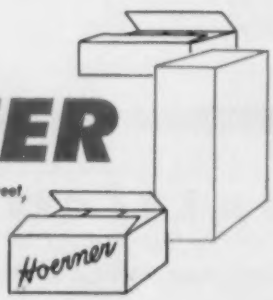
In seven years, The Roberts Manufacturing Company has manufactured and invoiced nearly $5 million worth of RANGER brand kitchen stove hoods and evaporative coolers. Approximately 200,000 Hoerner Packaging Units have been used to ship that equipment, and not one penny has ever been paid out for damage claims caused by carton failure. A Hoerner Packaging Engineer was called in to design Roberts' shipping cartons when the Company first started business in 1948. His close cooperation with the Roberts Company ever since has eliminated the possibility of damage claims due to improper package design.

*The Hoerner Packaging Engineer responsible: J. B. Davis, Jr.



HOW A HOERNER PACKAGING ENGINEER CAN HELP YOU!

If your company packages things, whatever they are, why not ask us to have a Hoerner Packaging Engineer come in and make an objective study of your packaging operations. It won't cost you a cent or obligate you in any way. It can mean an increased margin of profit through savings in labor and material costs, prevention of shipping losses. Just write to one of the Hoerner plants listed below.



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RADIOISOTYPES IN BIOLOGY AND AGRICULTURE *By C. L. Comar. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York City. 481 pages. 6¼ x 9¼ in., cloth. Price:* $9.

The application of radioisotopes in biology and agriculture and how the experimental work may be started is the theme of this comprehensive and authoritative work. Basic principles are presented clearly, unobscured by the theories of nuclear physics and experimentation.

Treatment of radioisotope experimentation provides the reader with detailed information as to facilities required and methods of procedure.

A valuable volume, the work compiles in one volume the necessary biological and chemical information necessary for planning and carrying out radioisotope tracer studies.

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STORAGE AND HANDLING OF SEMIPERISHABLE SUBSISTENCE ITEMS. *Published by Quartermaster Food and Container Institute, Chicago 9. 130 pages, paper. No charge. Proceedings of a symposium on establishing optimum conditions.*

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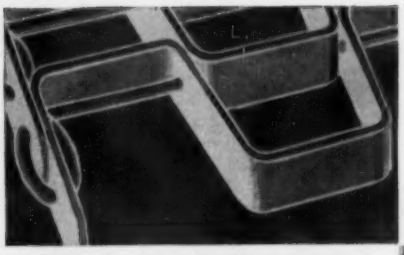

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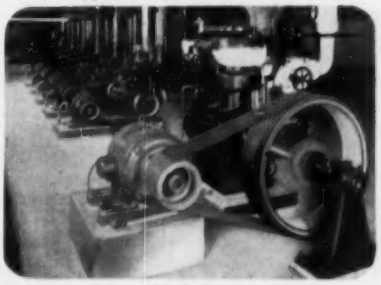

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Lockers for Uniforms

—*Continued from page 83*

Corp., New York City). Specifically, it requires no attendants.

Each uniformed employee is assigned his own numbered compartment in this multi-unit, 16-tier facility, along with a key. At his own convenience, he opens his locker and has, inside, his own "ordered to measure" shirts and trousers freshly laundered.

With his own locker-laundry number marked inside shirt bands and trouser waists, garments are worn by no one but himself. They are permanently issued to him.

After removing his supply of uniforms the worker places his soiled clothes in the compartment and then locks the door. The laundry picks them up.

Each compartment has space enough for 3 shirts and 3 trousers. However, the unit is not designed for uniform storage but only as a convenience for clean-laundry dispensing and soiled clothes pickup.

Several printed forms are supplied with the service, among them a "sign in" and "sign out" which make the employee responsible for loss of garments, less their normal depreciation. One form provides name card for locker, and another serves as an adjustment request (garment altering).

Should a key be lost, the compartment is opened with a master key and the entire lock is then replaced with a new one. Employee is charged 25c. for his new key.

Aids Suppliers, Too

The laundry's truck driver carries a master key for opening the entire front of each 16-tier locker. As soiled garments are removed from each compartment, the count is recorded on a printed form, a copy of which is left with the company. Cards on the compartments bearing employee identification numbers speed this operation.

Clean uniforms may be left either at the time of soiled-garment pickup or later. Time required for servicing a 16-compartment locker, including filling with clean garments, has been determined as approximately 3 min.

Once a driver is experienced in locker servicing, the new system should be much less time consuming for him than the old. Driver does not have to wait for a designated employee to turn over soiled clothes and to check in fresh laundry. Dual checking is eliminated.

In addition to the factor of the company's investment in the locker-dispenser units, laundry service cost per garment has risen. However, gains are cited as off-setting increased cost.

To sum up, time of stockroom attendants is no longer required for issuing uniforms, and no longer is it necessary for laboratory personnel to lose time waiting for garment issue.

This has provided an unmeasurable lift to morale. Also the fact that the uniforms each man wears are his own, ordered to size and altered, if necessary, to fit.

In addition, there is the space-saving feature of the dispenser and new convenience in its location.

When the Central Laboratories are moved to the new quarters in Tarrytown, N. Y., operations will be conducted in several separate buildings. So here, location of one or more laundry dispensing units in each building promises to go far in conserving wasted time and insuring even more convenience to laboratory personnel.

End (*Resume reading on page 84*)

Pushbutton Filtration

—*Continued from page 61*

required to tear down, wash up, and redress a plate-frame unit. Thus, each of the new filters is in effective use a greater percentage of the total cycle time than were the plate-frame ones.

A marked reduction in total filter area has been possible with this more efficient operation—i.e., 2,500 sq. ft. in the five new filters as compared to 5,000 net sq. ft. in the conventional plate-frame type.

A survey of filtering operations in four of our plants indicated that labor was 55-74% of total operating cost of plate-frame presses. The conventional filter station required 6 men at a total daily cost of $73.92. During last season's 190-day campaign this amounted to $14,045.

But with the newly engineered feed system, which assures an uninterrupted supply to the filters, no direct labor charge is made to the new self-cleaning station. Cleaning and precoating are so quickly and easily done that an operating foreman, or his assistant, does the task incidental to his other duties.

Instead of using laundered filter cloths, completely new filter media are applied each cycle, at reduced cost. Filter cloth preparation and washing has been eliminated. Cloth and chemical cleaning costs (1954) were approximately $6,500 for the 190-day campaign.

The filters being completely enclosed, it is possible to clean them efficiently with juice of high temperature. And the operator is protected from hazards of hot juice.

End (*Resume reading on page 62*)

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She earns her pay by having her picture taken on our color film all day long. The film is then sent to our processing stations all over the world and returned to Rochester to maintain a constant check on processing quality and uniformity. With all the continual chemical and physical control procedures, we still want the assurance of a pretty girl's picture.

He, surrounded by chemists, bakes all day. The chemists keep measuring the exact monoester content* of every production run of Myverol® Distilled Monoglycerides. They also make other chemical tests known to measure factors important for food components. No Myverol order leaves the plant until these chemists are satisfied; but then, just to make sure that some chemically negligible factor has not tripped us up, we have our master baker bake with it and evaluate his results with a skeptical old pro's eye. If he's happy, then we are too, as we go home to dinner clutching our individual fair shares of his labors.

For technical counsel and a cost analysis on the use of Myverol Distilled Monoglycerides in any food fat product write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York, Chicago, and Memphis • W. M. Gillies and Company, Los Angeles, Portland, and San Francisco • Charles Albert Smith Limited, Montreal and Toronto.

*It runs around 90 per cent—2 or 3 times that of conventional mono-di food emulsifiers—and this results in such baking industry economies that the demand grows and grows. That 90 per cent does not include 6 or 7 per cent of "2-monoesters," which our laboratory has found to contribute on its own to baking properties.

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KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

Reports New Filleter

Cleaned and deheaded fish are filleted with particular speed and efficiency by a new Danish machine, according to Fish & Wildlife Service.

Unit comes in two models—one for fish weighing 1-8 lb., the other for the 7-15 lb. range.

Speeds of 12-20 fish per min. have been attained, and fillets are cut cleanly from the backbone regardless of whether fish is in rigor mortis or is soft. Only one man is needed to operate each variable-speed unit.

Details on the new machine, which is being distributed by a Copenhagen firm, were gathered by F&WS's Market News Section, Washington, 25, D.C.

Straits Tin to Keep Coming

Continued reliable supply of tin from Malaya is seen assured following news from the Straits that the Malay-Chinese-Indian Alliance Party won a clear-cut victory in the recent elections.

By taking 51 of the 52 elective Council seats, this party signals political and economic stability ahead.

Currently, says the Malayan Tin Bureau, Washington, D. C., the U. S. is taking three-fifths of all Malaya's tin exports, which covers almost two-thirds of U. S. industrial consumption.

NSC Revamps Food Section

Reorganization of its food section is announced by the National Safety Council, Chicago.

The former three divisions have been abolished, with members now combined into two new groups: The *Food Processors Division*, which will include those engaged in harvesting, freezing, curing, canning, drying, manufacturing, storing, and other processing activities; and the *Food Retailers Division*, for hotel, restaurant, and supermarket operators.

ADMI Wins Grand Award

The American Dry Milk Institute, Inc., Chicago, has been selected as a 1955 grand award winner by the American Trade Assn. Executives.

Award was made for the Institute's development of the ADMI Stable Ferment Process (FE June '54, p. 58).

Congress Seen Acting on Additives; Bills Detailed, Groups Behind Them

The Congressional session that begins next January is expected to chalk up 1956 as the year of the food additive battle.

By the time Congressmen go home next Summer, there should be definite decisions on—

1. Whether the Food, Drug & Cosmetic Act should be amended concerning food additives.

2. If so, whether FDA should license additives before use—or should merely receive all test data on such materials and then be obliged to resort to court processes to stop the marketing of products containing additives it considered objectionable.

—And with nothing like unanimous agreement within the food industry as to what should be done, there will be fighting both in "official" channels—during legislative hearings—and behind the scenes. Presently, the industry lineup is as follows:

Best organized for the legislative battle is the so-called Chicago Group, which includes the Millers National Federation, American Meat Assn., American Bakers Assn., and American Dairy Assn.

Several years have been spent by the Chicago Group in drafting and redrafting a bill that would give FDA power to license additives before use. All four successive versions of this bill have been launched in Congress by Rep. Joseph O'Hara (R., Minn.), with Rep. J. Percy Priest (D., Tenn.) also introducing the last two, H.R. 7605 and 7606.

Slower to get started was the "conservative" group, which favors a mandatory submission of data to FDA, but with court action required to stop specific product marketing.

A majority of the Grocery Manufacturers Assn.'s policy committee

(*Turn to page 210*)

How Major Food-Additive Bills Compare

DUNN BILL (GMA & MCA)	O'HARA BILL (CHICAGO GROUP)
1. Manufacturer tests proposed new food additive and submits data to FDA, which considers data.	1. (Same procedure as given under Dunn Bill.)
2. FDA writes letter to maker telling him whether it considers tests adequate and material safe.	2. If it considers tests adequate, FDA issues regulation that approves additive's use.
3. If FDA says tests are adequate and material safe, maker may then market the material.	3. (Same as under the Dunn Bill.)
4. If FDA notifies maker that it feels additive is unsafe, maker may not market additive without giving FDA 30-days' notice, telling where he plans to make first shipment.	4. If FDA refuses to issue regulation, finding material unsafe, maker may then ask for public hearing on whether or not additive is safe.
5. FDA may ask Federal Court for injunction to halt sale.	5. On the basis of testimony, FDA again makes finding on safety.
6. To get injunction, FDA may use maker's data or other information in proving material unsafe.	6. Maker may appeal adverse ruling to Federal Appeals Court and must then prove that material is safe.
7. By definition additives covered include: Intentional additives, packaging materials and similar unintentional additives.	7. Only intentional additives are included. Packaging materials would still come under current law—Sec. 406(A)—which bars use if poisonous at any level.
8. Materials currently in use are exempted from this regulation.	8. Materials currently in use are exempt only if seen safe after long use.

Efficiency Checkreining Costs—Willis

The food industry's ever-improving performance in production and in marketing has eased the impact of mounting wages and other costs on the grocery bill, Says Paul S. Willis, president of Grocery Manufacturers of America.

Reporting in GMA's quarterly economic bulletin, he states that food industry wage rates have risen 38% since the 1947-49 period. But increased investments in advanced methods, plants, and equipment have held actual labor costs per unit of goods to a 24% rise.

"Net result is that labor costs have risen only three-fifths as fast as wage rates", asserts Mr. Willis. "And this divergence is highly favorable to the consumer."

Production efficiency and consumer savings will continue to rise, he went on. Here he cited how food processors have been carrying out projects seen running to nearly $600 million for new plants and equipment during 1955—10% over '54.

Food processors' 1954 capital investments per production worker were stated to total $17,000, whereas the figure was only $7,500 per worker in the last prewar year. The increased outlay has made possible a production increase of more than 10% per man-hour during the past three years alone.

"Roboting" Called a Must To Meet Needs of 1975

"Even with automation we may soon be seriously short of labor," says Henry F. Dever, president of Brown Instrument Div., Minneapolis-Honeywell Regulator Co.

He continues: If American workers are to continue to enjoy the trend toward shorter work weeks and ever-higher living standards, then means —automation or something as good— must be found to achieve the $875 billion gross national product that will be needed by 1975.

Problem factors cited by President Dever are lack of the necessary flexible robot units and the high cost of engineering and research needed to produce them.

C&H Crockett Workers Get a "Modified GAW"

In event of plant shutdowns, workers at California & Hawaiian Sugar Refining Corp., Crockett, Calif., are now to get payments from the company supplementing the state's unemployment benefits.

Specifically, C&H will pay amounts sufficient to bring the workers' totals up to 65% of their normal take-home. The payments would start in the third week of a shutdown and continue for 25 weeks.

The clause covering this "modified guaranteed annual wage" has been written in the contract with the AFL Sugar Refinery Employees union. It will not be invoked, however, until the California code is changed to assure workers they will receive these supplements without losing the rights to full state benefits.

Those having less than a year's service and those out of work because of a reduction in force are not covered. In fact, the contract calls for the company to lay off any workers not needed, reducing melt to the lowest economically feasible level so a shutdown won't be necessary. Another point: The company will not have to make payments if the plant is closed due to a strike or equipment failure.

Students 'Run' Factories

High school students are now gaining on-the-spot training in actual plant operation through a new plan sponsored in five cities by American Can Co.

Known as students-in-industry, the group receives a series of class-room lectures from company management on the economics and operations of the container and container-using fields.

Final phase will come when students move into the factory for one day, taking a hand in all positions from production to sales. The youngsters will work side-by-side with the regular supervisors, and handle correspondence, sit in on meetings, call on customers, and fill orders.

Tested on a "pilot" basis last year in three cities, the plan won hearty endorsement.

13 Warehouses Are Cited For Accident "Shutouts"

Safety certificates have been won by 13 refrigerated warehouses for accident-free records, announces the National Assn. of Refrigerated Warehouses.

Five plants gaining two-year honors are: Beall Refrigerating Co., Santa Clara, Calif., Germantown Cold Storage Co., Germantown, N. Y., Holly Cold Storage Co., Oakland, Calif., Lancaster Ice Mfg. Co., Lancaster, Pa., and Mowery Cold Storage, Mechanicsburg, Pa.

One-year awards went to the following eight companies: Alabama State Docks Board (Cold Storage Dept.), Mobile, Ala., Crosby Cold Storage Co., Olean, N. Y., Davis Frozen Foods, Lexington, N. C., Haddon Ice & Coal Co., Haddonfield, N. J., Little Rock Cold Storage Co., Little Rock, Ark., Port Everglades Refrigerating Co., Fort Lauderdale, Fla., Santa Clara Cold Storage & Freezer Co., Santa Clara, Calif., and York Cold Storage Co., York, Neb.

Sparking Glass-Container Progress

NEW RESEARCH CENTER houses 500 scientists and engineers for glass-container studies. Attractive facility, erected by Owens-Illinois Glass Co. at Toledo, Ohio, is equipped to carry projects from initial idea through the pilot-plant stage.

ONE NEW PROCESS produces glass containers that are 20% lighter than the old-style—yet just as strong. Commercial model of this experimental machine, says Owens-Illinois, will double present glass container production rates.

Tech Gains for Rice Millers

Improved rice milling practices can save processors several million dollars per year, suggests Southern Utilization Research Branch and U. of Arkansas researchers.

Rice kernels that break during milling operations cut down yield. Major cause of such damage, say the scientists, is improper relative humidity in the mill room. This should be kept between 70 and 80% to reduce mechanical stresses in the kernels.

Yield and huller capacity are also increased, where bran is held tightly to the kernel, by a combination of steaming and calcium carbonate abrasive treatment.

Millers may get further details from Southern Regional Research Laboratory, 2100 Robert E. Lee Blvd., New Orleans.

Hors d'Oeuvres

▶ By changing the color of a surface, you can make it look as much as 13.5% larger, according to research by Pittsburgh Plate Glass Co. Nice to know that colors come in sizes.

▶ Now you know how to get a large-looking food package without risking the penalty of slack fill.

▶ The fact that you particularly like or dislike a color doesn't make a surface look larger or smaller. The researchers don't explain why you see red when you get mad.

▶ Psychologists explain color-size effects this way: "In general, the longer the wave length of the colored surface, the higher its value, and the greater its chroma, the larger it will appear." Any questions?

▶ Don't expect simple answers. Hue, brightness, and chroma have individual effects that may be additive or subtractive. But you can't say we didn't tip you off.

▶ Obesity has replaced vitamin deficiency as the number one nutrition problem in the United States. Obviously, our high standard of living hasn't gone to our heads.

▶ Russia is plagued by poor performance in food production and processing. If she let her people eat cake, maybe they would produce some frosting.

▶ Louisiana State University reports that rice hulls can be made into a light-weight, low-cost "brick" which absorbs atomic radiation. Now we tell the Japanese!

▶ Expansion of the Government subsidized school-milk program will provide more milk for children at little or no cost to the youngsters. But this will keep up the price mothers pay for milk at the store.

▶ New Denver dairy beverage is called "Moo' Gay". Must come from super-contented cows.

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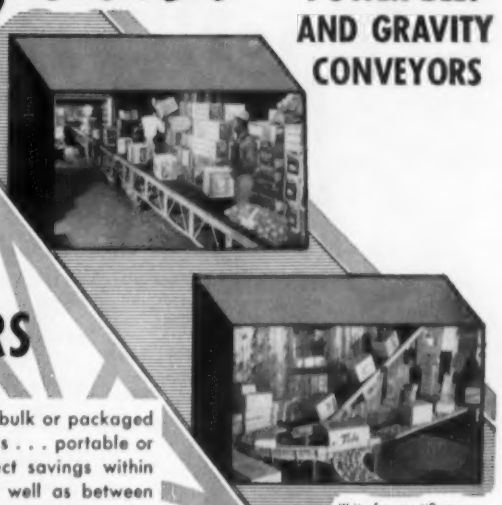

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Takes Marine Tech Post

Appointed as Professor of Marine Food Technology and Marine Food Technologist on the staff of the U. of California's Institute of Marine Resources is Harold S. Olcott, USDA food specialist. He comes to his new post after 14 yr. with the Western Regional Research Laboratory, where he directed several research groups. Further, he is a recipient of American Chemical Society's Eli Award in bio-chemistry and of a USDA Superior Service Award. He is also a councillor-at-large of IFT.

Combines Fish and Whey In New Feed Supplement

A new process aimed at converting "trash" fish into a high-potency supplement for chicken feeding is now under pilot-plant test in space provided by the New Bedford Institute of Textile & Technology, New Bedford, Mass.

Developed by Prof. Milton E. Parker, director of food engineering, Illinois Institute of Technology, Chicago, the patented method combines two recognized sources of "unidentified growth factors"—namely, fish and cheese whey.

"Resultant product," declares Prof. Parker, "is 3 to 5 times as rich as conventional supplements and acts as a 'spark plug' to make chicken feeding grains more digestible."

Initial research will evaluate varieties of industrial fish obtainable in New Bedford.

Facilitating the investigation, NBI has named Prof. Parker as visiting professor of food engineering.

FDA Plans Check on Milk For Antibiotics, Pesticides

Concern over the effect of antibiotics and insecticides in the nation's milk supply has prompted FDA to project a countrywide survey.

Samples will be obtained from grocery stores—100 from each of FDA's 16 district offices—and tested for residues of animal-feed antibiotics and pesticides such as DDT.

FDA's apprehension is two-fold: (1) Because milk is the major food of infants and invalids, the agency feels no such residues should appear, and (2) presence of antibiotics might cause allergies to such persons or later make it unsuitable for them to be given antibiotics as curatives.

To Electro-Clean Smoke

Smokehouse exhaust gases are to be controlled by an electrostatic precipitator being installed at Luer Packing Co., Vernon, Calif.

The pioneering idea involves carrying smoke through six stacks to the electro-unit. Here, it will be washed, positively charged, and have particles removed by negative plates. Resultant discharge is expected to be 98% free of smog-producing pollutants.

Russians Get Look at Advanced U. S. Processing

Sharp-eyed members of the visiting Russian farm group wound up their recent month-long U. S. tour by inspecting processing facilities at Exchange Lemon Products Co., Corona, Calif. Here, they view equipment used in formulating quick frozen lemonade concentrate. White-shirted man, third from right, is the group's leader, Vladimir Matskevich, who is USSR first deputy minister and acting minister of agriculture.

Action on Additives

(*Continued from p. 207*)

and GMA Counsel Charles W. Dunn have favored this approach, as have several broad-line food makers and the Manufacturing Chemists' Assn. This bill was first introduced by Rep. Priest as H.R. 7607, and later by Rep. O'Hara as H.R. 7764.

Two other bills are also in the hopper. One of these is H.R. 4475, presented by Rep. Joseph Delaney (D., N. Y.). It is much more restrictive than any industry group would support. The second bill is H.R. 5, put forward by Rep. A. L. Miller (R., Neb.). This is a so-called compromise approach.

But the only bills that stand a real chance of adoption are those of the Chicago Group and GMA-MCA (see comparative chart on p. 207).

Not all food makers can be identified with one or the other of these two important bills. And, in fact, there is a large, but unorganized, segment that feels no legislation is needed.

Here, in general, is the "frame" of this latter position: Almost every maker of a food additive now clears his product with FDA. And every food maker, before buying a new product, asks the supplier what FDA has said about it. No food maker is going to risk his reputation fighting an FDA seizure or injunction order. So why is legislation needed?

The fourth group to be considered is the FDA itself. FDA men definitely favor the licensing type of approach. They consider the Delaney Bill as ideal—adding that with some modification the O'Hara measure would do. They strongly oppose injunctive-type bills, since they would then have to prove an additive harmful in order to get an injunction.

Neither of the major bills is considered adoptable in present form, since there are differences other than just that relative to the licensing-versus-injunction type of control.

These are among the smaller points of controversy:

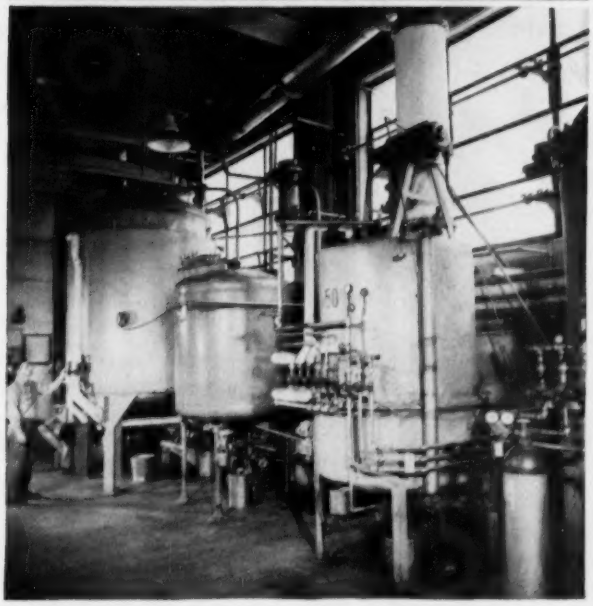
▶ **Should packaging materials and similar unintentional additives be treated in the same manner as intentional additives?**

The GMA-MCA Bill says "Yes". For example, if a small amount of mold preventive is used in cheese wrappers, FDA should have to go to court to prove it harmful in the amount used in order to stop use.

The O'Hara Bill says "No". Here, such unintentional additives would still fall under Section 406(a), which makes products on which they are

(*Turn page*)

Why OLEORESINS?



BECAUSE they are unmatched for fidelity of flavor, uniformity, economy and convenience of handling.

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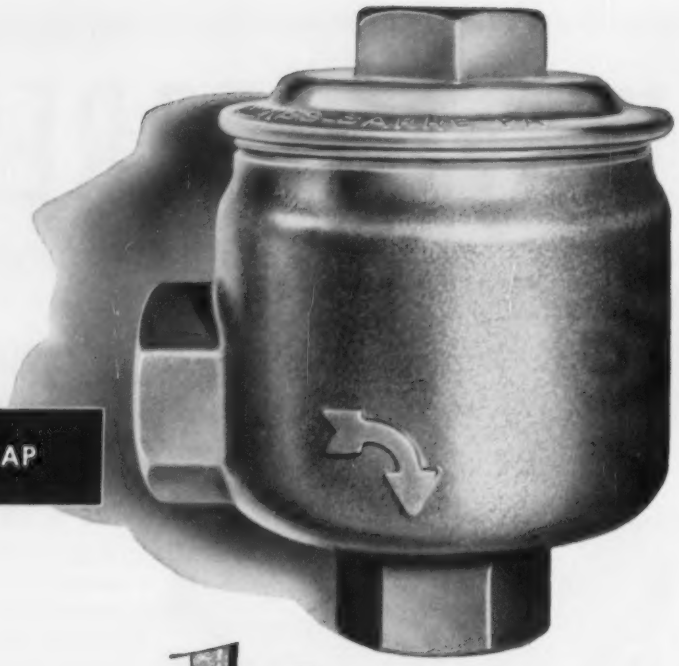

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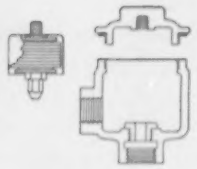
Quality



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used liable to seizure if the material is harmful in any amount.

▶How should accidental contaminants (such as a disinfectant getting into the soup kettle) be handled?

The GMA-MCA Bill would again make FDA prove it harmful in the amount used. But O'Hara would keep liability to seizure as it now stands.

▶Should FDA be allowed to charge fees for clearing food additives?

The agency says "yes", citing the precedents of the Miller Pesticide Amendment and the Eisenhower Executive Order telling agencies to make their services self supporting. But most of industry says "no", unless other FDA operations, such as those covering new drugs, are also brought under fee provisions.

▶Should an advisory panel be called to judge safety of a new additive?

This point, once argued by major groups, has now been settled. Although such a provision was included in the first three drafts of the O'Hara Bill, it is eliminated from the current one, reportedly because of a fear of the academic approaches that such an advisory panel might take.

Of course, some of these factors may be modified by the time the new Congress makes its first official additive move, expected in late January or early February with hearings before Rep. Priest's House Interstate & Foreign Commerce Committee.

Any bill reported from the Committee would then go to the full House for action, after which a Senate committee would hold hearings, and make recommendations to the full Senate.

If the bill passed by the full Senate is different from the one passed by the House, it would have to go back for House approval. The bill then would proceed to the President for signature.

So, with the promised early start of hearings, enactment is quite possible during 1956—unless some legislator purposely "throws" a block.

Action on Standards

Agricultural Marketing Service (AMS) and Food & Drug Administration (FDA) have taken the following actions on U. S. Grade Standards and Definitions & Standards of Identity. References are to *Federal Register*.

Currants, dried, AMS revision of U. S. Grade Standards, Aug. 10 *F. R.*, p. 5758.

Dates, AMS revision of Grade Standards, Aug. 10 *F. R.*, p. 5755.

Pears, winter, AMS revision of Grade Standards, Aug. 10 *F. R.*, p. 5752.

Raisins, processed, AMS revision of

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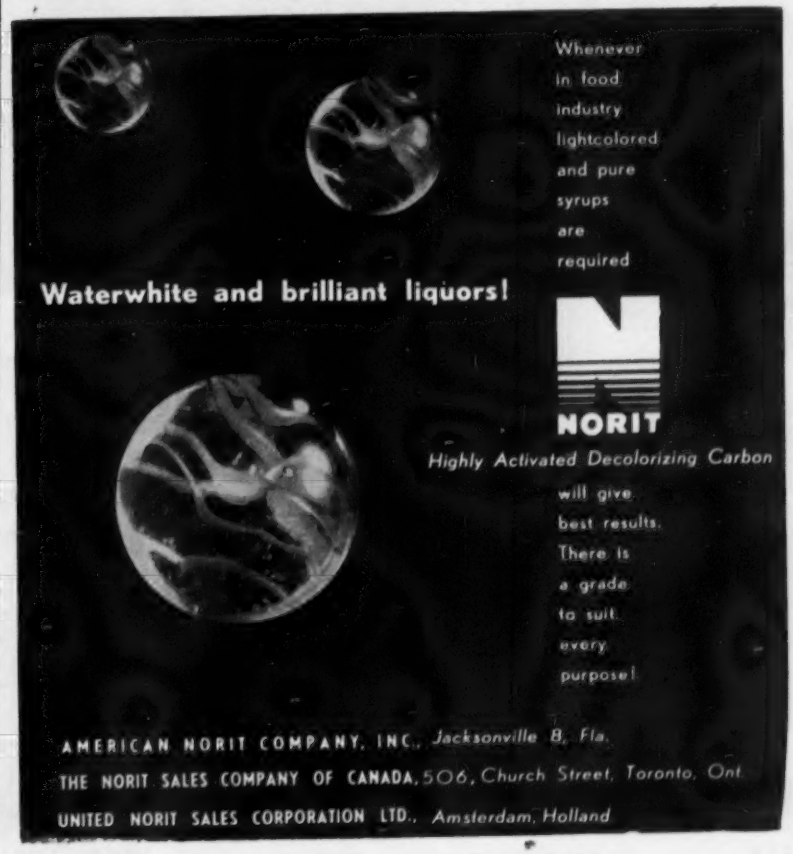
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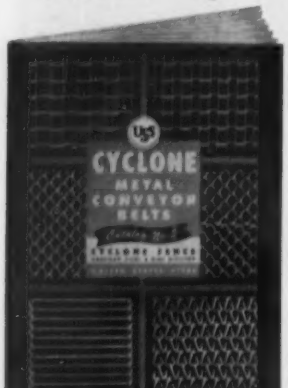

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UNITED STATES STEEL

Grade Standards, Aug. 10 F.R., p. 5760.

Oranges and tangelos, Florida, AMS proposed revision of Grade Standards, Aug. 18 F.R., p. 6024.

Cheese, partially creamed cottage, FDA proposed Definition & Standard of Identity, Aug. 23 F.R., p. 6141.

Monterey cheese, FDA Definition & Standard of Identity, Sept. 9 F.R., p. 6607.

Pineapple, canned, and pineapple juice, canned, FDA proposed Definitions & Standards of Identity, and quality and fill of container, Sept. 17 F.R., p. 7008.

Fruits and vegetables, proposed tolerances for methyl bromide, F.R. Aug. 17, p. 5975; proposed tolerances for EPN, ferbam, zineb, ziram, Aug. 18, p. 6030; proposed tolerance for methoxychlor, Aug. 23, p. 6142; proposed tolerance for glyodin, Aug. 24, p. 6193; proposed tolerance for parathion, Aug. 30, p. 6357; and tolerance established for Systox, Sept. 2, p. 6489.

Briefly . . .

• **CRANBERRY CONCENTRATE has big potential market as coloring for canned lemonade, according to Morris April, president of Morris April Bros. Citrus canners find this concentrate adds needed hue without taste interference.**

• EXPANSION PROBLEMS of small business are being weighed in seminars just launched at the Institute of Arts & Sciences, Columbia U. Among the lecturers is John M. Fox, president of Minute Maid Corp.

• **FOOD-CAN PRODUCTION for the first half of '55 topped 17 billion cans—a 10% increase over similar '54 figures—says American Can Co. Fruit, vegetable, and juice packers have absorbed 4¼ billion, and 3 billion have gone to beer packers.**

• CALIFORNIA ASPARAGUS PACK has set new records according to the California Asparagus Advisory Boards. Canned pack of 4,144,637 cases shows an increase of 1,150,000 cases over 1954 figures. Frozen figures are up 1,300,000 lb. to 7,782,964 lb.

• **MINUTE MAID CORP. has consented to dispose of the frozen citrus juice facilities it recently acquired from Snow Crop Div. of Clinton Foods. The Justice Department had objected that MM's operation of properties at Dunedin and Frostproof, Fla., would inordinately lessen competition. And rather than enter long litigation, in support of its stand, the company has complied with the judgment.**

• "10 and 11 OZ. BEER containers ought to be banned," say some brewers, "because consumers may confuse them with the regular 12-oz. articles." However, Internal Revenue's answer is to require clear labeling of such cans and bottles rather than to drastically outlaw them.

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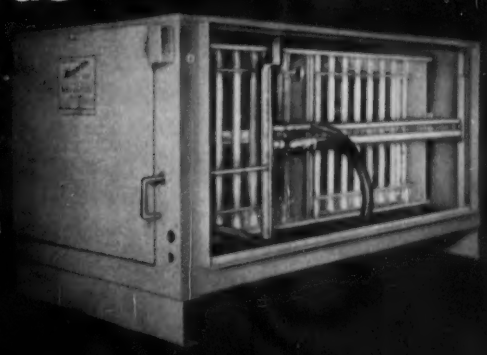

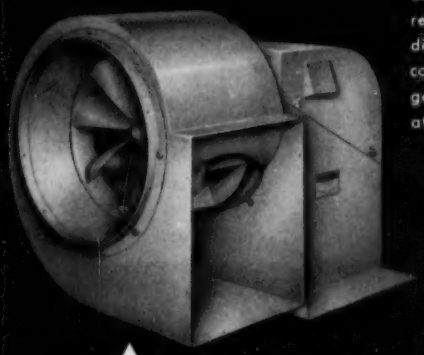

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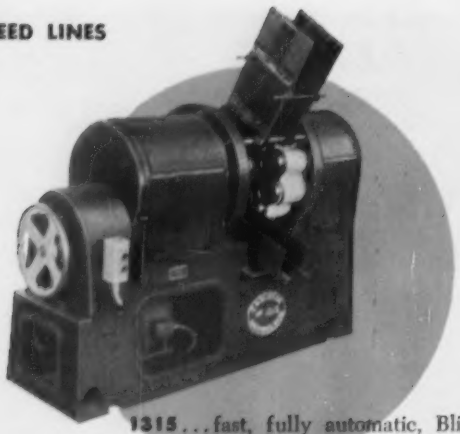
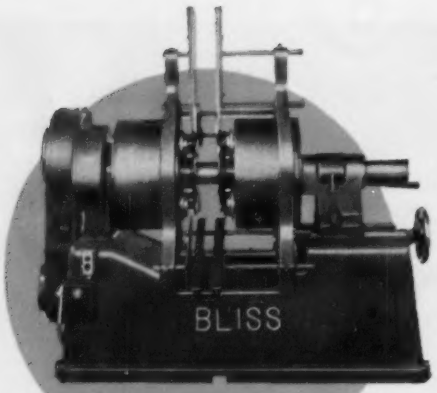


1315... fast, fully automatic, Bliss' 8-station, rotary round can double end flanger handles diameters from 2 to 4¾", heights from 2 to 8".



1416... big brother to the 1315, this double end, 4-station rotary round can flanger handles No. 10 and other sizes.

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Here are typical improvements:

On the rectangular flangers... Bliss' exclusive flanging action eliminates danger of body buckle; dies never "squeeze" bodies, never exert damaging end pressure. Extra-long slide gibbing means longer service life.

On high-speed round can flangers... Long cylinder slides provide more accurate alignment, last longer. Small diameter turrets work smoother at high speeds.

Rectangular or round, *all* Bliss flangers feature heavy, vibration-dampening frames, modern motor drives and controls. Improvements like these are typical of the news that's coming from Bliss' new plant at Hastings, Michigan. A new scroll shear, new strip feed press—in fact, Bliss' entire line of high speed machinery has been redesigned with an eye to greater accuracy, lower maintenance and longer life.

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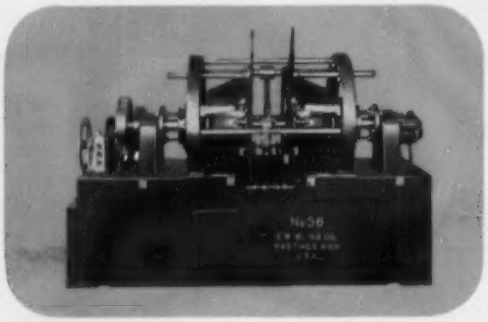

35 & 36... largest of them all, these 4- and 3-station, double end, rotary machines flange square, rectangular, oblong cans up to 8¾" high.

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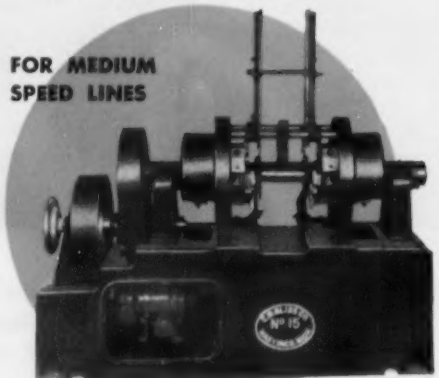

15... Bliss 4-station, rotary flanger for round cans from 2 to 4¾" in diameter, from 2 to 8" high.

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10–13—National Coffee Assn., annual convention; Mark Hopkins Hotel, San Francisco.
10–14—Plant Layout Technical Workshop; Greater Pittsburgh Airport Hotel, Pittsburgh.
16–18—Brewers' Assn. of America, annual convention & exhibit; Edgewater Beach Hotel, Chicago.
17–21—National Safety Congress & Exposition; La Salle Hotel, Chicago.
18–21—American Dietetic Assn., annual meeting; Kiel Auditorium, St. Louis.
19–21—National Pickle Packers Assn., annual convention & machinery exhibit, Sheraton Hotel, Chicago.
23–25—Western Regional Frozen Food Convention; Mark Hopkins Hotel, San Francisco.
23–25—National Pretzel Bakers Institute, annual convention; Shoreham Hotel; Wash., D. C.
23–28—International Assn. of Ice Cream Manufacturers, annual convention (24-26); Milk Industry Foundation annual convention (26-28); Dairy Industries Supply Assn. (23-28); Jefferson, Statler, Chase Hotels, St. Louis.
30–31—Mayonnaise, Salad Dressing Mfrs. Assn.; Hotel Homestead, Hot Springs, Va.
31–N2—Packaging Institute, annual forum; Hotel Statler, New York City.

November

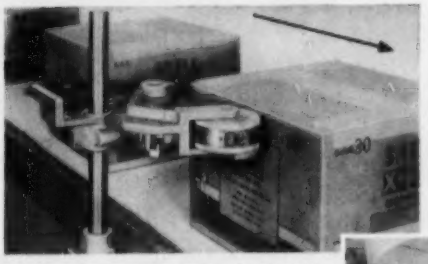
5–14—International Exhibition of Bottling Equipment & Related Industries; Exposition Park, Porte de Versailles, Paris, France.
6–9—International Popcorn Assn., Hotel Morrison, Chicago.
7–11—National Hotel Exposition; Kingsbridge Armory, Bronx, New York City.
9–11—Industrial Management Society, time-and-motion study & management clinic; Hotel Sherman, Chicago.
11–15—American Meat Institute, annual convention; Palmer House, Chicago.
14–17—International Automation Exposition; Navy Pier, Chicago.
14–17—American Bottlers of Carbonated Beverages, exposition & convention; Dinner Key Exposition Hall, Miami, Fla.
14–18—American Society of Mechanical Engineers, power show; Coliseum, Chicago.
15–16—Dairy Industries Society, International, annual meeting, Shoreham Hotel, Wash. D. C.
15–16—American Corn Millers Federation; Sheraton Hotel, Chicago.
16–18—Assn. of Food Industry Sanitarians, annual meeting & conference; Hotel El Rancho, Sacramento, Calif.
16–18—Grocery Manufacturers of America, annual meeting; Waldorf-Astoria Hotel, New York City.

Erratum

Inadvertently, a line of type was dropped from the bottom of the column headed "Chances Weighed" on the first page of the article "Whither FDA" (FE Aug., p. 91). Following is the correct text, with italics indicating the words that were omitted: "*Rockefeller liked the idea. He asked for a more* specific proposal, which he later 'sold' to Mrs. Hobby."

For quicker warehouse stacking, quicker identification...

MARK ALL 4 SIDES OF CASES AUTOMATICALLY...*in a single pass*



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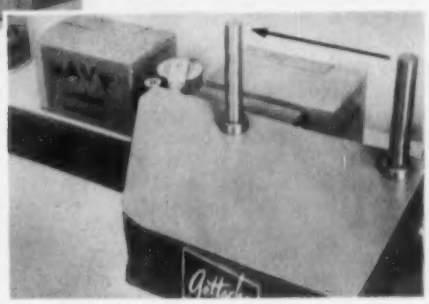
MARKING MACHINE
imprints *front* and one *side* panel simultaneously

ROLACODER 200
MARKING MACHINE
imprints *rear* and other *side* panel simultaneously



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FOR FOOD INDUSTRY CLEANING

Cheese Shelf Life

—Continued from page 93

trouble with psychrophilic organisms, though they did not do so previously. This may be due to drought conditions forcing a change in water sources. However, it could also relate to the greater time required (up to 12 days) for marketing of the cottage cheese.

Data in Table V show that almost all of the Illinois samples were highly contaminated with psychrophyllic organisms.

The above microbial counts show the great need for improved sanitary practices in cottage cheese production. Undoubtedly if other dairy products indicated the same absence of sanitary control procedures that some of the cottage cheese samples did, these products would be confiscated by control authorities.

Approximately one-fourth of the manufacturers can produce cottage cheese without excessive contamination. This proves that good methods are practicable and attainable.

Also, only one-fourth of the samples had code dates—which is still further evidence of insufficient supervision by top management of the cottage cheese operations.

End (Resume reading on page 94)

TABLE II—SOURCES of Organisms That Contaminate Cottage Cheese

Psychrophilic	Coliform	Yeasts and Molds
1. Wash water	1. Pipes	1. Pipes
2. Cheese vat	2. Cheese vat	2. Cheese vat
3. Agitators, knives, paddles, etc.	3. Agitators, knives, paddles	3. Agitators, etc.
4. Dressing or creaming mix	4. Dressing or creaming mix	4. Dressing or creaming mix
5. Cans used to store cream dressing or curd	5. Cans used to store cream, dressing or curd	5. Cans, etc.
6. Homogenizer	6. Homogenizer	6. Homogenizer
7. Pipes	7. Filler, or packaging units	7. Filler or packaging units
8. Filler or packaging equipment	8. Curd scoops	8. Curd scoops
9. Curd scoops	9. Vegetables used to flavor cottage cheese	9. Cartons and lids
10. Vegetables used to flavor cottage cheese	10. Other equipment not sterilized, or products not handled in right way	10. Vegetables used to flavor cottage cheese
11. Other equipment not sterilized, or unpasteurized products used in cottage cheese manufacture		11. Other equipment not sterilized or products not handled in sanitary way
		12. Air

TABLE III—INCIDENCE of Coliform Organisms in Cottage Cheese Samples

Organisms (Per Gram)	Illinois Samples		Conn. Samples*	
	Number	Percent	Number	Percent
0-9	6	28.57	28	33.33
10-99	4	9.05	19	22.62
100-999	3	14.28	19	22.62
1,000-9,999	5	23.82	14	16.67
10,000-99,999	1	4.76	2	2.38
Greater than 100,000	2	9.52	2	2.38
Total	21	100.00	84	100.00

**Chemical, Bacteriological and Organoleptic Characteristics of Retail Cottage Cheese,* Conn. Bul. 284, 1950.

TABLE IV—YEAST and Molds Counts

Yeast & Molds (Per Gram)	Ill. Samples	
	Number	Percent
0-9	6	28.57
10-99	2	9.52
100-999	5	23.83
1,000-9,999	2	9.52
10,000-99,999	3	14.28
Over 100,000	3	14.28

TABLE V—INCIDENCE of Psychrophiles in Cottage Cheese

Psychrophiles (Per Gram)	Illinois Samples	
	Number	Percent
10,000-99,999	6	28.57
100,000-999,999	6	28.57
1,000,000-9,999,999	2	9.53
Over 10,000,000	7	33.33

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. . . more than 47 types and weights of belting for transmission, elevating and conveying to serve the needs of all types of industries.

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Sparks Belting has been approved by FOOD SANITATION ENGINEERS and is being used right now by the largest handlers of foodstuffs in America. It resists bacterial growth and is easy to clean. Sparks Belting is ideal for difficult jobs. It will operate trouble-free and economically, as many have discovered. If your product is hot or cold, wet or dry, raw or cooked, rough or smooth, oily, greasy, packaged or in bulk, Sparks has a belt to meet the needs of canners, bakers, confectioners, meat handlers and all food manufacturing and processing concerns.

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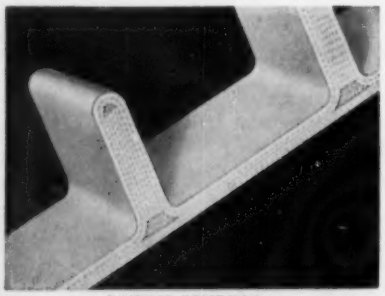

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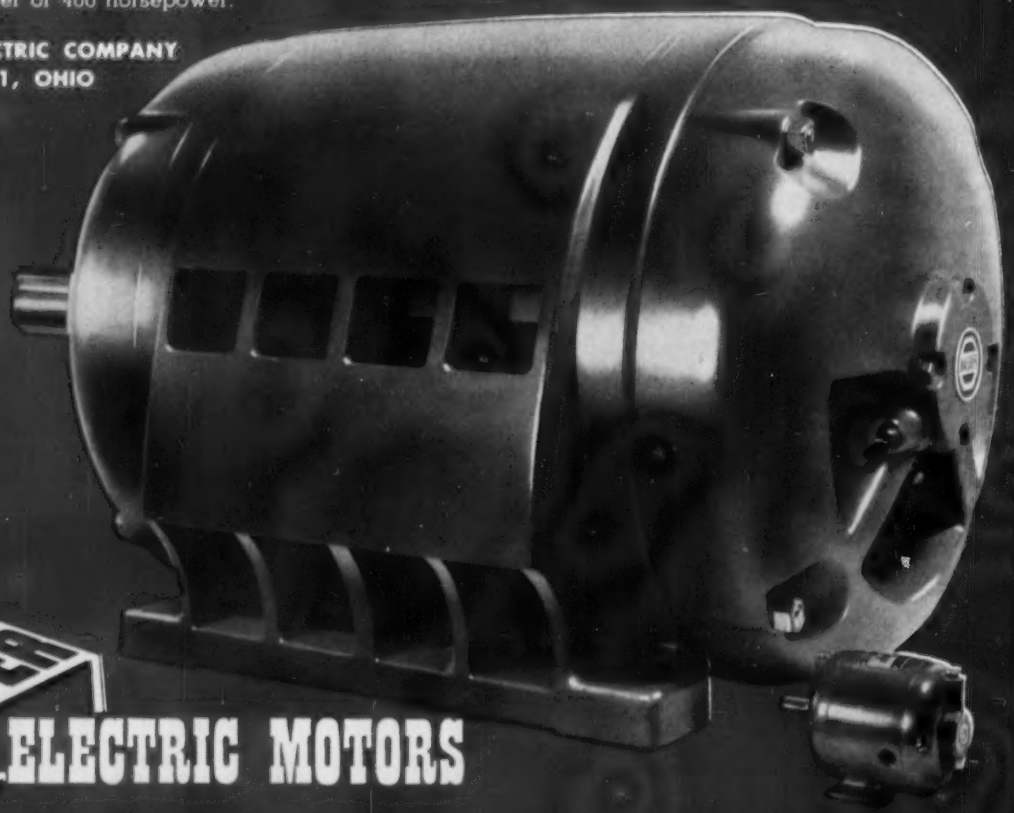

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PRODUCTS

Beer-Foam Stabilizer Comprising Hydroxypropyl Methyl Cellulose Having 0.05-0.2 Hydroxypropyl, 1.5-2 Methoxyl Groups Per C_6 Unit—M. A. Weaver, Ithaca, and G. K. Greminger, Jr., Midland, to Dow Chemical Co., Midland, Mich. No. 2,712,500. July 5, 1955.

Diacasein by Processing Skim Milk to Yield Dry, Neutral, Low-Ash Product Readily Water Dispersible and Slow Setting—F. H. Bernhardt, Holt, E. R. Eckhardt and M. H. Janson, Mason, Mich., F. H. Tinkler, Silver Springs, Md. to American Home Products Corp., New York City. No. 2,714,068. July 26, 1955.

Ice-Box Dessert Prepared by Adding Water to Cheese-Gelatin Mix, Whipping, Cooling—G. H. Stuart, New York City, and J. T. Watson, Tarrytown, N. Y., to Borden Co. No. 2,714,069. July 26, 1955.

Foodstuff Comprising Mixture of Mayonnaise, Plastic Starchless Base of Dried Defatted Milk Solids—H. M. Levin, Philadelphia. No. 2,715,068. Aug. 9, 1955.

Pre-Cooked Rice by Soaking Raw White Grains to 25-35% Moisture, Heating, Drying to 8-14% Moisture, Expanding at High Temperature—R. L. Roberts, Walnut Creek, Calif., to U.S.A. No. 2,715,579. Aug. 16, 1955.

PROCESSES

Cleaning Poultry Gizzards by Cutting One Wall to Partially Open Interior, Spraying to Dislodge Contents, Cutting Adjacent Walls—W. J. Patterson, LaGrange, and J. Weissenstein, Chicago, to Swift & Co., Chicago. No. 2,712,671. July 12, 1955.

Dehydrating Solid Foods by Successively Contacting With Hot, Cool Fat, Volatile-Oil Solvent, Heating at 140-180 F. —W. A. Webb, Salinas, Calif. No. 2,712,698. July 12, 1955.

Making Skim Milk Cheese by Adding Starter to Milk (Less Than 2% Fat), Holding at 70-78 F., Coagulating, Heating Curds to 80-100 F., Centrifuging—G. J. Strezynski, Poughkeepsie, to Faster Food Products Co., New York City. No. 2,712,999. July 12, 1955.

Increasing Yield of Oleoresin From Pepper Berries by Extracting From Portion Having Low Specific Gravity—H. R. Ansel, Elmwood Park, Ill., to Wm. J. Stange Co., Chicago. No. 2,713,000. July 12, 1955.

Aging Meat by Storing in Unitary Wrapper Comprising Absorbent Material and Moisture-Vapor-Permeable Film, Subjecting to Ultra-Violet Radiation—B. E. Williams, Hillsboro, to Lamitex Products, Redwood City, Calif. No. 2,713,002. July 12, 1955.

Refining Rough Rice by Treating With Basic Solution to Penetrate Inner Cells, Neutralizing, Hulling, Breaking, Oxidizing—U. B. D'Atri, Van Horn, Texas. No. 2,713,542. July 19, 1955.

Recovering Glutamic Acid From Hydrolyzate by Adjusting End-Liquor pH to 1-3.5, Adding CH_3OH, Separating—F. A. Hoglan, Glen View, Ill., to International Minerals & Chemical Corp. No. 2,713,592. July 19, 1955.

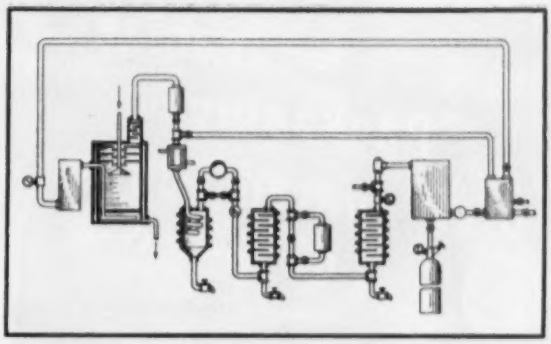
Supporting Poultry for Picking by Holding Head Above Legs, Extending Legs Laterally From Body—I. R. Lentz and D. B. Van Dolah, to Swift & Co., Chicago. No. 2,714,223. Aug. 2. 1955.

Drying Crystalline Salt by Fluidizing With Heated Gas Under Pressure—W. W. Niven, Jr., Prairie Village, Kan., to Midwest Research Institute, Kansas City, Mo. No. 2,715,282. Aug. 16, 1955.

EQUIPMENT

Cherry Pitter Consisting of Longitudinally Inclined Table, Transverse Sockets With Apertures Extending Through Table, Depressed Tracks, Stripping and Plunger Bars, Depending Plungers, Lifter Bars—T. T. Hirao, Pasco, Wash. No. 2,712,333. July 5, 1955.

Proofer-Tray Loader Having Drum-Like Carrier With Space Tracks, Slidably Mounted Loader Cups, Transfer Wheel, Actuating Means—W. P. Brustle, to J. H. Day Co., Cincinnati. No. 2,712,376. July 5, 1955.



Essence Recovery Unit Employs Inert Gas

Fruit juices are stripped of volatile flavors by inert, non-condensible gas in chamber (left). Mixture comprising gas, water vapor, and volatiles is cooled in a first stage at 32-33 F., then at successively lower temperatures to precipitate water vapor and flavors. Stripping gas is recycled to process.—F. Fessler, Newark, N. J. No. 2,714,573. Aug. 2, 1955.

Cheese Extruder Employing Receptacle, Cylinder, Interconnecting Conduit, Cylinder Head With Coaxial Aperture, Adjacent Plate Having Aligned Aperture, Plunger Means, Sleeve—V. G. Comparette, Gardena, Calif. No. 2,712,693. July 12, 1955.

Ice Maker With Vertical Freezing Drum Having Cylindrical Ice-Forming Surface, Upper Water Reservoir, Annular Channel, Flake - Removing Means—G. M. Lees, Seattle, to Col-Flake Corp., Chicago. No. 2,712,734. July 12, 1955.

Dough Molder Comprising Compression Chamber, Roller, Side Plates, Die—J. F. Naylor, to T. & T. Vicars, Ltd., Earlestown, England. No. 2,712,798. July 12, 1955.

Apparatus for Forming Alimentary Paste Consisting of Housing With Elongated Tube Between Inlet and Outlet, Extruder Plate, Worm Screw, Perforated Disk, Vacuum Means—M. & G. Braibanti, Milan, Italy. No. 2,712,799. July 12, 1955.

Hydrometer Having Elongated Tubular Float Body, Ballast, Upper Cap With Axial Cylindrical Opening, Telescoping Indicator—C. E. Watson, New York City. No. 2,713,258. July 19, 1955.

Liquid Sampling System Comprising Receiver, Pressure and Vacuum Sources, Interconnecting Line, Sample, Measuring, and control Valves—R. M. Langsenkamp, Indianapolis, In. No. 2,713,268. July 19, 1955.

Continuous Corn Popper Consisting of Trough, Agitator, Feed Means, Vertical Partition, Carriage, Track, Discharge Aperture—H. R. Crank, Overland Park, Kan., to T. E. Scofield, Kansas City, Mo. No. 2,713,302. July 19, 1955.

Extrusion Die for Alimentary Pastes Having Elongated Slot, Opposed Lugs, Ledges, Spaced-Apart Notches—F. D. Femina, to V. La Rosa & Sons, Brooklyn, N. Y. No. 2,713,313. July 19, 1955.

Shuffle-Type Fruit Feeder Comprising Supply and Discharge Chutes, Fruit Elevator, Reciprocating Means—W. C. Belk, Lakeland, Fla., to Food Machinery & Chemical Corp., San Jose, Calif. No. 2,713,434 July 19, 1955.

Want more information on any of these recent patents — If so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

Fruit Orienting Device Consisting of First Rotatable Shaft With Cylindrical Element Concentrically Mounted, Second Parallel Shaft With Oppositely Disposed Annular Member, Cradle-Type Pockets—J. H. Amori, San Jose, Calif. No. 2,713,934. July 26, 1955.

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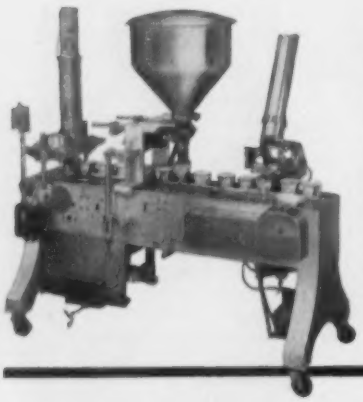

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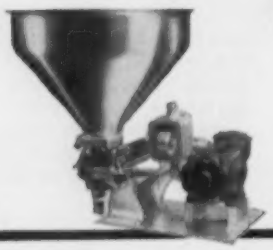

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Bin-Level Indicator Consisting of Vertical Support, Leaf-Spring Contacts, Resistor, Film Means, Pressure Equalizer, Electric Circuit—J. W. Andersen, Dayton, Ohio, to Chemstrand Corp. No. 2,713,793. July 26, 1955.

Dough Embosser Adapted for Impressing Pattern on Traveling Sheet to Be Divided After Baking—R. J. Fay, Villa Park, Ill., to Schulze & Burch Biscuit Co. No. 2,713,833. July 26, 1955.

Meat Chopper Plate Cleaner Comprising Fluid Container, Cover With Slidably Journaled Shaft, Plate Support, Guide Means—J. V. Longan, Archer City, Tex. No. 2,713,867. July 26, 1955.

Cake Slicer Having Receiving Well, Spaced Blades, Plunger With Cake-Engaging Face, Slots, Turntable, Discharge—G. Hill, Bettendorf, and P. C. Bauer, Davenport, to Bettendorf Bakery Equipment Co., Bettendorf, Iowa. No. 2,713,880. July 26, 1955.

Centrifugal Dust Collector Employing Angular Separator Unit for Imparting Vortical Motion to Gas Stream, Dust Chute, Sheet Member—J. Phyl, Fanwood, N. J., to Research Corp., New York City. No. 2,713,920. July 26, 1955.

Cherry Stemmer and Sorter Having Squirrel-Cage Cylinder With Axially Extending Rods, Longitudinal Conveyor, Stem-Retaining Apron, Feed, Discharge Means—H. M. Schubert, Salem, Ore. No. 2,713,944. July 26, 1955.

Thermostatic Mixing Valve Comprising Housing, Valve Body, Concentric Rotatable Sleeve with Hot-, Cold-Water Inlets, Temperature-Control Means—A. E. Geise, Yakima, Wash., to G. A. Geise and M. Likely. No. 2,713,972. July 26, 1955.

Flour-Milling Apparatus Consisting of Grinder, Separator Having Successively Finer Screens, Settling Chamber, Blower—H. A. Noll, Dusseldorf, Germany, to H. H. & H. Mfg. Co., Chicago. No. 2,713,977. July 26, 1955.

Tank Cleaner Employing Turret and Nozzle Adapted for Differential Rotation About Perpendicular Axes—M. T. Kennedy, Jr., Port Washington, and L. F. De Wald, Great Neck, to Pyrate Sales, Inc., Bayside, N. Y. No. 2,714,080. July 26, 1955.

Fish Filleter Having Parallel Superimposed Conveyors, V-Shaped Blades, Actuating Means—A. Gradoff, I. Vinoff, San Francisco, and K. W. Howell, San Mateo, Calif. No. 2,714,221. Aug. 2, 1955.

Feather Plucker Comprising Cylindrical Rubber Drum, Integral Lateral, Peripheral Projections, Drive Means—S. W. Mc Kendree, to Mc Kendree Products Co., Klamath Falls, Ore. No. 2,714,222. Aug. 2, 1955.

Dryer for Washed Eggs Employing Movable Flights, Transverse Fixed Alignment Wires, Sheet Members, Discharge—W. J. Reading, Ottumwa, Iowa. No. 2,714,257. Aug. 2, 1955.

Peanut Dryer Consisting of Hot-Air Duct, Longitudinally Spaced Outlets, Suspension Means, Vehicle Mounted Bin Elevator—C. C. Smith, Slocomb, and W. E. Leverette, Ashburn, Ga. No. 2,714,258. Aug. 2, 1955.

Automatic Egg Cleaner Having Parallel Rails, Advancing Means, Cylinders With Peripheral Abrasive—C. C. Powell, Bellevue, to National Poultry Equipment Co., Renton, Wash. No. 2,714,786. Aug. 9, 1955.

Rotary Dryer Comprising Furnace, Fan, Horizontal Cylindrical, Conical Sections, Vertical Collector, Recycle Duct—G. Hallvorsson to Edw. Renneburg & Sons, Baltimore. No. 2,715,283. Aug. 16, 1955.

PACKAGING

Fruit Container Consisting of Tray With Opposite Upright End Walls Joined by Laterally Extending Rails, Spaced Rows of Pads Forming Concave Pockets, Transverse Ribs, Longitudinal Supporting Bar—J. E. Murphy, Hicksville, and M. Schnall, Brooklyn, to See-Qual Package Corp., Brooklyn, N. Y. No. 2,712,383. July 5, 1955.

Stopper and Pouring Device With Thin-Walled Cylindrical Plug Having Screw Thread, Lower Cutting Edge, Upper Head, Flange Ring, Pivoted Closure Disk—E. A. Young, Kingston, British West Indies. No. 2,712,886. July 12, 1955.

Ventilating Produce Bag Having Open-Mesh Fabric, Bottom Panel, Side and Top-Forming Strip, Continuous Stitched Seam.—J. L. Quinn, Jacksonville, Fla., to Bemis Bro. Bag Co., St. Louis. No. 2,713,370. July 19, 1955.

Preserve-Container Cover Consisting of Rigid Plastic Flat-Body Plate, External Annular Flange, Internal Hollow Boss, Sealing Chamber—C. A. Hirschberg, Mountain Lakes, N. J. No. 2,713,436. July 19, 1955.

Box-Filler for Fruit Employing Feeding Channel, Aligning Means, Counting Wheel, Closure Gate, Actuating Circuit —T. M. Vaughan to United Paper Co., Tampa, Fla. No. 2,713,446. July 19, 1955.

Pouring-Type Coffee Can With Swingable Closure, Hermetic Sealing Ring, Tearing Loop—J. E. Everett, Wilmette, Ill. No. 2,713,956. July 26, 1955.

Filler for Large-Mouth Containers Employing Vibrating Turntable for Close Packing—N. A. Siegal to I. Swartzberg, Chicago. No. 2,713,960. July 26, 1955.

Carton Packager Having Feed Conveyor, Means for Orienting, Lifting, Conveying, and Depositing Groups of Containers—J. K. Bruce, S. Pasadena, and G. L. Frank, Los Angeles, to Bruce Engineering Corp., San Francisco. No. 2,714,481. Aug. 2, 1955.

Self-Sealing Wrap Consisting of Non-Porous Sheet Between Rubber and Wax Films—J. M. Hechtman, Munising, Mich., to Munising Paper Co., Chicago. No 2,714,562. Aug. 2.

Printing on Polyethylene by Applying Ink Containing Infra-Red-Ray Absorbing, Heat-Generating Material, Subjecting Surface to High-Intensity Infra-Red Radiation to Anchor Image—K. S. Hoover, Elmhurst, to A. B. Dick Co., Niles, Ill. No. 2,715,363. Aug. 16, 1955.

Thaw Indicator for Frozen Food Packages Consisting of Semi-Solid pH Indicator, Contacting Reservoir Having Water-Dispersed Ions That Cause Color Change on Diffusion—J. S. Beckett, Glendale, and W. J. Marenus, Los Angeles, to Aseptic Thermo Indicator Co., Los Angeles. No. 2,716,065. Aug. 23, 1955.

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Zips Off Feathers

—*Continued from page 107*

they drop into the loading chute of the Spiral Picker.

The automatic shackles have spring-loaded shafts which apply tension to the wires holding the bird's feet. As birds reach the unloading station, the shoulder atop the shackles passes underneath two inclined bars. These bars depress the springs and release the feet, letting the birds drop into the loading chute.

As the shackles move again into the loading area, they pass under similar inclined bars which open the wires, permitting the bird's feet to be inserted. Then the wires automatically close.

End (*Resume reading on page 108*)

Mechanized Quarter-Mile

—*Continued from page 97*

the flow of sugar through the scales. If the scale lags behind the amount of sugar supplied it, the conveyor belt stops. It restarts as soon as the receiving bin is dumped. After weighing, the sugar is elevated on another conveyor to the top of the pier building.

To this point the sugar is handled on a single belt. When reaching the top of the pier, however, the sugar is divided and dropped onto two conveyors. These run along the top of the pier building parallel to the ship, leading to the gantry cranes which, in turn, feed the trimmers in the holds of the ship.

The conveyor from the warehouse to the batch-scale building and the conveyor from the scale building to the top of the pier are two-speed belts. When only one gantry crane is operating, these conveyors operate at half speed. When the two cranes are used, the conveyors operate at full speed. If one crane stops, the conveyors immediately drop to half speed.

A tripper, attached to each gantry crane, removes the sugar from the cross conveyor, transferring it onto a shuttle conveyor. From here it moves to the gantry crane boom.

Each crane can travel the entire length of the pier so that two ship's holds can be loaded simultaneously. Power, control, and telephone cables from the cranes can be attached to outlets located in seven positions along the pier. Crane, conveyor, and trimmer controls are on a compact, pushbutton panel operated by a deckman at the rim of the hatch. This panel is portable. The complete loading operation is started and stopped with one button on the control panel.

With the gantry crane boom in loading position, the tube and trimmer extend down into the ship's hold. A 30-ft. tube, attached to the crane boom, drops the sugar from the conveyor, at the top, to the trimmer-belt conveyor below.

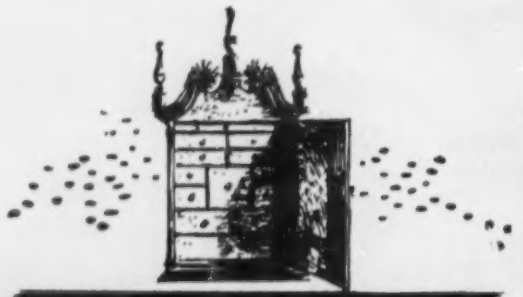
The trimmer has two motors. One is needed to swing and turn the trimmer. Another, a 40-hp. motor, drives the trimmer belt. This short, endless belt is operated at a high speed, to throw the sugar at top velocity. The trimmer operator can direct the stream of sugar in a 360-deg. circle to fill all parts of the hold.

Electrical controls on all conveyors are interlocked. If any conveyor along the line stops, all others in proper subsequent order also stop, thus preventing sugar from piling on the floor.

The trimmer motors must come to full speed before the series of conveyors feeding them are started in sequence. Stopping requires a similar sequence control. Necessary emergency stops are located along the conveyors and include signal horns and buttons and telephone communications.

Motor-driven brooms on each conveyor clean accumulated sugar off the belts.

End (*Resume reading on page 98*)



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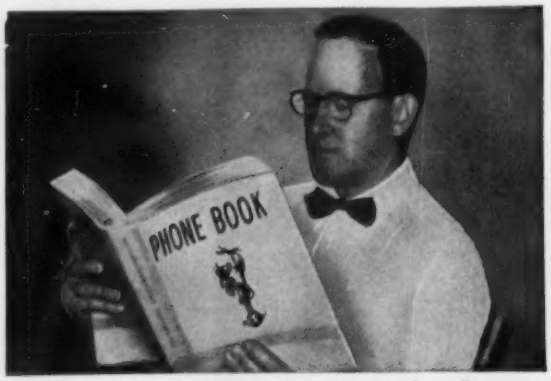

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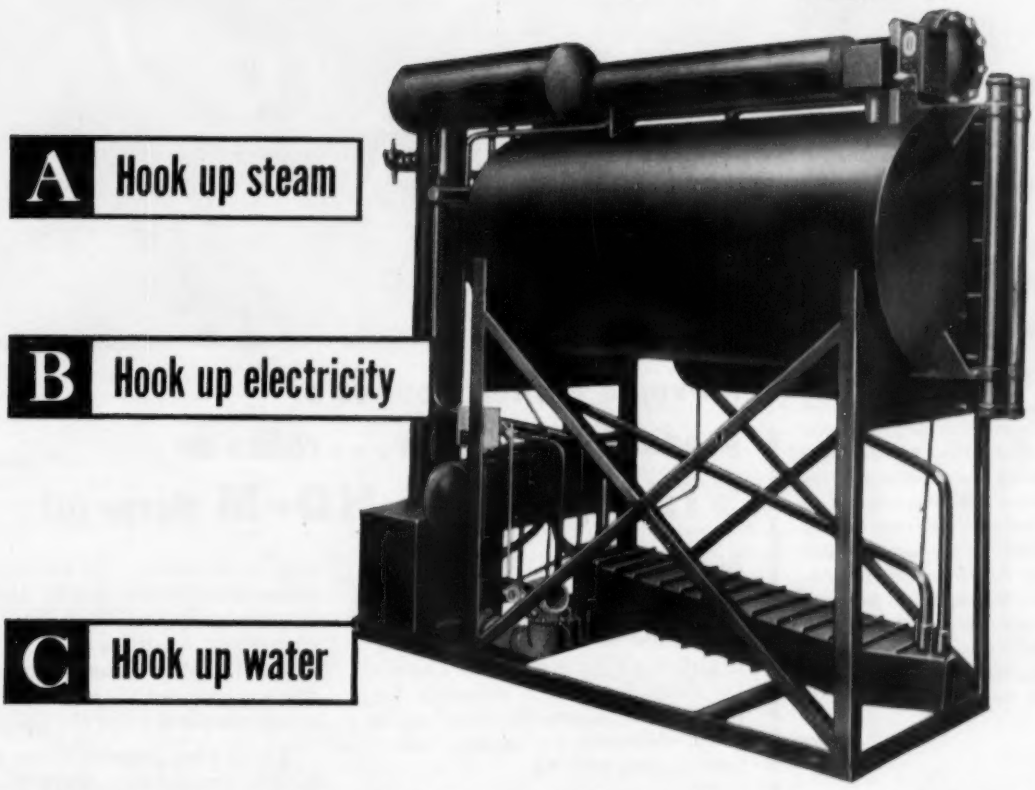

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SERVEL, INC., Dept. FE-105, Evansville 20, Indiana

Please send me specifications and full information on new water chiller with packaged control.

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T. J. Salo, Jewel Tea Co., Inc. (left), and B. J. Toale, Standard Oil automotive engineer, discuss lubrication. Barney Toale has been providing lubrication engineering service to accounts like Jewel for 18 years. Barney received his engineering training at the University of Wisconsin, has completed Standard Oil Automotive Engineering School. Customers find this experience and training pay off for them.

Moves a million pounds of produce every night . . . relies on

STANOLUBE HD-M *Motor Oil*

IN CHICAGOLAND, Jewel Food Stores moves a million pounds of produce and bread by truck from warehouse to retail market every night, six nights a week. There's no room in such a schedule for lubrication failure. So Jewel relies on a dependable motor oil—STANOLUBE HD-M.

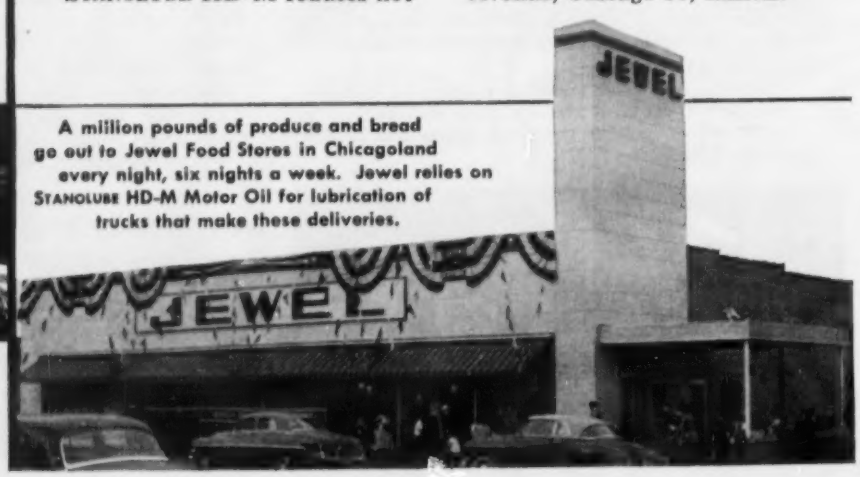
The high quality base stock of STANOLUBE HD-M teamed with additives that are exclusive Standard Oil developments, give STANOLUBE HD-M ideal properties for the kind of service required of it by Jewel Tea Co.

STANOLUBE HD-M reduces hot engine deposits. In addition it keeps valve stems free of deposits because of its excellent detergent-dispersant qualities. And STANOLUBE HD-M overcomes the sludging experienced with ordinary oil when unstable fuels are used.

These properties of STANOLUBE HD-M are helping Jewel Tea deliver on schedule in all kinds of weather, under an almost infinite range of driver handling. It can do the same for you. Find out. In the Midwest call your nearby Standard Oil office. Or contact, Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)



A million pounds of produce and bread go out to Jewel Food Stores in Chicagoland every night, six nights a week. Jewel relies on STANOLUBE HD-M Motor Oil for lubrication of trucks that make these deliveries.

Men & Companies

Manning Exton, Elmer Sprenkel and John Kiessling (left to right) have been named to high executive posts for Seabrook Farms Co., integrated farming and food freezing concern. Exton will become budget director and a v.-p. of the company, Sprenkel, treasurer and Kiessling comptroller.

Industry

Beach Milk Co. of Denver has been purchased by **Fairmont Foods Co.** of Omaha.

Blue Moon Foods, Inc., Thorp, Wis. firm purchased in March by **Foremost Dairies Inc.,** will become **Foremost-Blue Moon Cheese, Inc.**

Campbell Soup Co. is now using its new 270,000 sq. ft. distribution center in Camden, N. J.

Carnation Farms has purchased **Occidental Creamery** of Redwood City, Calif.

Cella Vineyards, Reedley, Calif. and **Calif. Transcontinental Wine Co.** of Fresno, have been elected members of the **Wine Institute.**

D. L. Clark Co. of Pittsburgh has merged with **Beatrice Foods Co.,** Chicago.

Crystal Cola-Cola Co., Tucson, Ariz., has been bought for $1.75 million by Lawrence Mayer of Tucson and S. A. Gersten, N. Y. C.

C&W Candy Corp. of Dover, Del., has filed a charter of incorporation with authorized capital stock of $1,000.

Dutch Maid label margarine is being produced in a new plant in Salem, Ore., designed for 12,000 lb. capacity each 8-hr. shift.

Dominion Dairies Ltd., Montreal, has purchased **Fairfield Modern Dairy Co., Ltd.**

Dreher Packing Co. has begun construction of a new $400,000 processing plant to replace one destroyed by fire in April.

Frankenmuth Brewing Co., Frankenmuth, Mich. has been incorporated by Bruce Berckmans for $50,000.

General Mills Ltd. of Canada has begun construction of a 27,000 sq. ft. addition to be used for cereal processing.

Gunther Brewing Co. will erect a new office building in Baltimore, Md.

Grape Belt Preserve Co., Inc. of Westfield, N. Y. has leased its plant and facilities to **Westfield Food Products, Inc.**

Theo Hamm Brewing Co. has announced plans to expand its St. Paul facilities with a new five-story structure.

H. J. Heinz Co. has begun construction of its new $3 million research & quality control center in Pittsburgh.

Hygrade Food Products Corp. has acquired **Land O'Frost Co.** of Chicago.

Laddie Foods Co. has been incorporated in Wilkes-Barre, Pa. with capital of $75,000.

Klein Ice Cream Co. of Houston, Tex. has been purchased by **Swift & Co.**

Menon Starch Co. has begun initial operations at its new potato-starch plant at Moses Lake, Wash.

Nat'l Dairy Products Corp. has announced plans to buy **Bedford Products Inc.,** jelly and preserves producer of Dunkirk, N. Y., for 38,500 shares of stock.

"RUGGED

Partlow Temperature Controls need no babying"

. . . so tough in fact that you can drop Partlow Controls on a concrete floor — without upsetting control accuracy!

DOES YOUR PROCESS require precise temperature control of gas, liquids or solids in the —30°F to 1200°F range? If "yes," there's a guaranteed Partlow Control to do your job better than complicated, less rugged thermocouples and other types — *and at lower cost!* Send us your problem. Partlow, specializing in temperature, designs controls for all types of new and existing applications. Here are five basic Partlow advantages:

1. **DIRECT-ACTING** hermetically sealed Mercury Bulb instrumentation. Positive, precise, sensitive—never temperamental.
2. **INTERCHANGEABLE ELEMENTS** — for quick, easy field replacement.
3. **ACCURATE CALIBRATION** — conservatively, within 1% of scale range.
4. **LONG LIFE**—thick-walled capillaries and seamless tubing assure almost indefinite life.
5. **LOW INITIAL COST** . . . low upkeep — few moving parts — no need for compensators.

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Recording Controller operates fuel valves or relays to start and stop combustion systems or electric heater loads.

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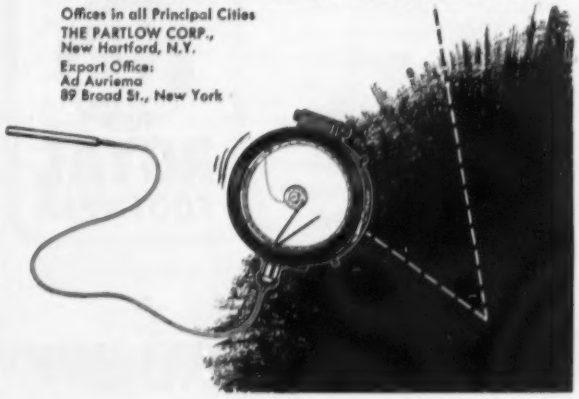
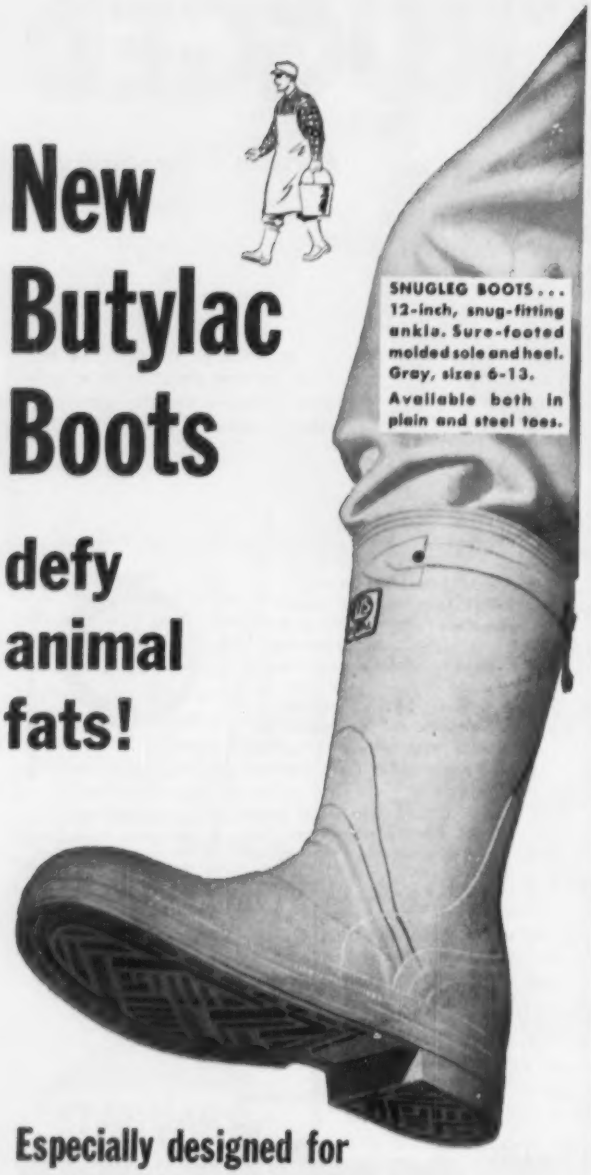


New Butylac Boots defy animal fats!


SNUGLEG BOOTS . . .
12-inch, snug-fitting ankle. Sure-footed molded sole and heel.
Gray, sizes 6-13.
Available both in plain and steel toes.

Especially designed for dairies and meat packing plants

Men in these industries will find Butylac Boots invaluable. Their high resistance to butter fats, animal fats, lactic acid is exceptional. Butylac Boots are comfortable, durable. Stretchy net lining and cushion insole. Deep cleated, molded soles resist slipping. *Butylac Boots you need.*

US RUBBER ROYAL FOOTWEAR

US RUBBER **UNITED STATES RUBBER COMPANY**
ROCKEFELLER CENTER • NEW YORK

Clifford Spiller (left) has been named director of marketing and **George White** (right) manager of operations, for General Foods' Maxwell House Div.

Nicolay-Dancey, Inc., of Detroit, has purchased facilities of **Mello-Crisp Potato Chip Co.**, also of Detroit.

Nu-Way Foods Co. has purchased new and modern facilities in Atlanta, Ga.

Pepsi-Cola International, Ltd. has opened its second bottling plant in Venezuela.

Southwest Food Products Co. of Los Angeles has legally changed its name to **Dude Ranch Foods.**

T.A.B. Co. has announced plans to build a $150,000 rice mill in Stockton, Calif.

Western Condensing Co.'s board has approved a proposal to merge with **Foremost Dairies, Inc.**

W. T. Young Foods, Inc. of Lexington, Ky. has been acquired by **Procter & Gamble Co.**, Cincinnati, Ohio.

Personnel

Charles Allen, Jr., has been elected to the board of Pepsi-Cola Co.

Howell Boyd has been named manager of Swift & Co.'s soybean mill in Champaign, Ill.

J. Frank Burke is new president of Fanny Farmer Candy Shops, Inc., Detroit.

W. Tresper Clarke of New York City has been appointed chief chemist of William Neilson Ltd., Toronto, Canada.

Ellsworth Glattly has been appointed manager of Buffalo plant of Russell-Miller Milling Co.

Kenneth Froelich has been named executive vice-president of Halter's Pretzels, Inc. of Canton, Ohio.

Claude Fuqua, Jr. has been elected president of Mrs. Tucker's Products.

E. Burke Giblin has been appointed general manager of Walter Baker Chocolate & Cocoa Div. of General Foods Corp.

Dr. Samuel Goldblith has been named executive officer of dept. of food technology at Mass. Instit. of Technology.

Joseph Harmuth, Jr. is assistant to the president of Home Packing Co., Toledo.

Dr. Clayton Kempf has been made v.-p. of Foremost Dairies, Inc. Research Foundation.

Theodore Manuele has been named general manager of Family Products Co., Phila.

Thomas McCabe, president of Scott Paper Co., is now a director of Campbell Soup Co.

J. M. Page has been appointed comptroller and secretary of H. J. Heinz Co. of Canada Ltd.

Charles Tobin has joined the engineering department staff of Nat'l Dairy Research Labs, Inc., Oakdale, N. Y.

Sanford Werbin has been named director of research for Basic Foods Sales Corp.'s Frost-O-Fast Div.

Associated Industries

American Can Co. has broken ground at Arlington, Tex. for a new can factory.

American Seal-Kap Corp. has elected M. C. Kaplan v.-p. and director.

American Viscose Corp. has changed its trade name from **Sylvania** to **Avisco.**

Ball Bros. Co., Inc. has appointed James Donaldson general manager of its West Coast Div.

Calif. Packing Corp. has started work on a new plant at Toppenish, Wash., expected to be in operation some time in 1956.

Cherry-Burrell Corp. has completed its new shop in Little Falls, N. Y., designed to manufacture storage tanks.

Chester-Jensen Co., Inc. of Chester, Pa., has acquired the assets of **Purity Mfg. Co.,** Cattaraugus, N. Y. Both firms manufacture equipment for the dairy industry.

Continental Can Co. has named Dr. Robert M. Brick, former director of metallurgical engineering at Univ. of Pa., director of its dept. of metallurgy.

Corning Glass Works' president, William Decker, is one of ten new directors of the **American Management Assn.**

Crown Cork & Seal Co.'s can division plant in Chicago is being expanded.

Crown Zellenbach Corp. plans to build a $2 million bag plant at Antioch, Calif.

Dewey & Almy Chemical Co. has completed a new plant in Greenville, S. C. for manufacture of Cryovac plastic bags.

Diamond Alkali Co. has named James Hughes treasurer.

Felton Chemical Co., maker of essential oils and flavoring materials, announces expansion of its distribution facilities in Mexico with a move into new and larger quarters in Mexico City.

Foil Kraft Inc. is building a $1 million plant in East Los Angeles expected to double production of aluminum foil food containers.

Hinde & Dauch has begun production of corrugated boxes at its new plant in Gastonia, N. C.

Liquid Carbonic Corp. has sold assets relating to its bottling machinery line to **George J. Meyer Mfg. Co.,** Milwaukee, **Barry-Wehmiller Mach. Co.,** St. Louis, and **Crown Cork & Seal Co., Inc.,** Baltimore.

Morton Hodgson, former assistant to the president, has been elected president of the Coca-Cola Bottling Co. of Calif.

Marathon Corp. has announced plans for a long-range development program in the South, initiated by recent purchase of a paper mill site and connecting carrier railroad line in Ala. and Miss.

Monsanto Chemical Co. is increasing production and storage facilities at its plant in Everett, Mass.

Package Machinery Co. has moved its N. Y. office to midtown Manhattan.

St. Regis Paper Co. has acquired more than 95% of outstanding capital stock of **General Container Corp.,** Cleveland.

Southwest Research Institute has appointed as research manager, Boyd Ladd, former economist to the U. S. executive office of the President.

White Metal Mfg. Co. has appointed William Suggs manager of newly-established can division.

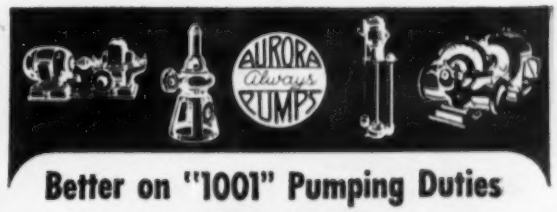
Deaths

Henry Allen, 82, retired v.-p. and director of Bemis Bag Co.—Aug. 13.

Donald Brindle, 47, owner of Ward's Cove Cannery, Ketchikan, Alaska—Aug. 27.

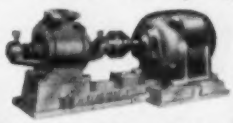
A. J. Dannemiller, 76, founder and board president of Dannemiller Coffee Co., Brooklyn, N. Y.

George Tong, 44, vice-president of Green Giant Co.—Sept. 5.



Better on "1001" Pumping Duties

Capacities to 150 G.P.M.

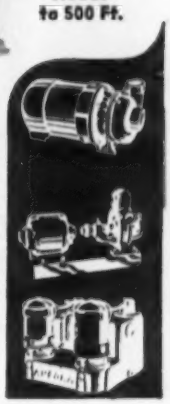


Heads to 500 Ft.

APCO Two-Stage Turbine Type Pump for High Pressure Service

Apco—the pump with but one moving part, the impeller — is famous for long-lived, efficient performance on small capacity, high head duties. Available in Single Stage, Two Stage and 4-Stage Tandem for high pressures — and Water Jacketed for high temperature and highly volatile liquids.

Write for Bulletins 111, 111-A, 111-WJ



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BRICK & TILE FLOORS ARE NO BETTER THAN THEIR JOINTS!

Save the critical 5% joint area represented by a one-eighth inch joint in a floor using 4" x 8" bricks and save your entire floor from costly corrosive damage prevalent in most food processing industries.

HYDROMENT JOINT FILLER has proved its resistance to corrosion in food industries for more than 16 years. Tight, waterproof, corrosive resistant, non-shrinking HYDROMENT joints assure durable, attractive brick and tile floors and walls.

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when you need STAINLESS PIPE...

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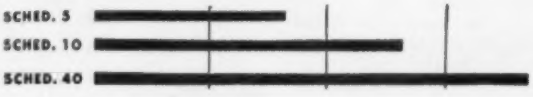
Here's A Cost Comparison on All Three



Here's How All Three Compare in Weight

To get the most economical stainless pipe for handling corrosive fluids, Schedules 5, 10, and 40 should be closely compared for:

initial cost
installed cost
ease of handling
flexibility of assembly
flow capacity
adequate allowable working pressure
effective corrosion resistance
service life

Whichever Schedule—5, 10 or 40—is best for your service conditions, Carpenter makes it to meet ASTM pipe specifications. Carpenter Stainless Pipe is available in sizes up to 4 inches, depending on weight . . . in AISI stainless analyses plus Carpenter Stainless No. 20 Cb, and Carpenter Alloys B and C for super corrosion resistance. For services requiring extra smooth surfaces, Carpenter Stainless Pipe can be supplied with 80 to 320-grit polished I.D. and/or O.D. finishes. Adequate stocks are as close as your local distributor. Call him for information and time-saving delivery.

Carpenter

Stainless Tubing & Pipe

Just Off the Press

New Catalogs and Bulletins from manufacturers of equipment and supplies —Free For The Asking—

PLANT ENGINEERING

Grinders and Feeders

Treats of grinder and feeder series and other auxiliary equipment. Diagrams and photos of typical installations provide additional information.—*Pulva Corp., Perth Amboy, N. J. (231A)*

Laminated Pipe

Illustrated details of new laminated plastic pipe, said to possess features of high strength, inertness to chemicals, and maximum thermal shock resistance. Bulletin FTL-1, 4 p.—*Resistoflex Corp., Belleville, N. J. (231B)*

Fluid Drives

Full data and illustration of a dry fluid drive system, employing a granular flow charge. Bulletin A640, 12 p.—*Dodge Mfg. Corp., Mishawaka, Ind. (231C)*

Compact Thermocouples

Describes two lines of sensitive thermocouples, with outside diameters of $\frac{1}{8}$ in. and $\frac{1}{16}$ in, used where accuracy is important. Units available in lengths from 6 to 72 in. with open terminal block assemblies, general purpose heads, or screw-covered terminal head assemblies. Specification Sheet 57, 2 p.—*Minneapolis-Honeywell Regulator Co., Philadelphia. (231D)*

Refrigeration Equipment

Descriptions and pictures given for a series of auxiliary refrigeration units such as storage coolers, condensers, slug eliminators and balance loaders. Units available in a wide range of sizes to fit almost any industrial cooling application. Bulletin 4001, 4 p.—*Patterson-Kelley Co., Inc., E. Stroudsburg, Pa. (231E)*

Wide Switch Line

Catalog illustrates and specifies a line of high sensitivity, double case, immersion proof, general purpose, direct current, and sub-miniature switches. Operating characteristics, base terminal data, and physical dimensions also included. Catalog 655, 24 p.—*W. L. Maxson Corp., New York City. (231F)*

High Vacuum Pumps

Considers background engineering data for a series of high vacuum pumps. Mechanism and maintenance are detailed and the full line of single stage piston-type units are discussed and pictured. Catalog 425, 52 p.—*New York Air Brake Co., Kinney Mfg. Div., Boston. (231G)*

Humidifying Principles

Full details given on the effects of over-dry air. Desirability of a steam-type humidification system detailed with diagrams, data, and illustrated applications. Bulletin 500, 16 p.—*Armstrong Machine Works, Three Rivers, Mich. (231H)*

Fire Extinguishing System

Treats of foam-type fixed and portable equipment for fire control. Detailed drawings illustrate model layouts and pictures show component parts. 34 p.—*American-LaFrance Corp., Elmira, N. Y. (231I)*

Immersion Heaters

Considers method of heating liquids by means of an immersed gas burner. Contains data on correct selection and installation of equipment. Bulletin H-11, 4 p.—*Eclipse Fuel Engineering Co., Rockford, Ill. (231J)*

Variable Speed Drive

Handy booklet gives detailed information on selection of fractional horsepower motor drives. Contains pertinent engineering data, complete ratings, dimensions, and list prices. Bulletin M-543, 24 p.—*Reeves Pulley Co., Columbus. (231K)*

Specialty Steels

Guide for the selection of a broad range of special purpose steels that comprises tool and die, stainless, silica and high nickel electrical alloy, valve, heat resistant, and super alloy metals. Various tubings, pipe, fine wire specialties are included. 32 p.—*Carpenter Steel Co., Reading, Pa. (231L)*

Dust Control Unit

Justifies operation and features of a series of dust collecting air cleaners. Recent design improvements are detailed. Tables give engineering factors and selection data. Bulletin 277-B, 22 p.—*American Air Filter Co., Inc., Louisville, Ky. (231M)*

Steam Generators

Treats of construction and control assemblies for a line of packaged steam generators, ranging in capacity from 10,000 to 46,000 lb. steam/hr. Sectional drawings and installation photographs illustrate features. Chart gives control and burner selection. 16 p.—*Foster-Wheeler Corp., N.Y.C. (231N)*

Special Drain Valve

Considers advantages of a drain and sampling valve for use under severe pressure and temperature conditions. Outside threads and valve-stem seating reduce possibility of freezing. Data Unit 270, 2 p.—*Jerguson Gage & Valve Co., Somerville, Mass. (231O)*

Magnetic Valves

Catalog depicts wide line of magnetic valves for automatic remote operation. Tables provide necessary selection data and prices. 20 p.—*Magnatrol Valve Corp., Hawthorne, N. J. (231P)*

Vertical Turbine Pump

Diagrams and cutaway views illustrate all features of a turbine-type vertical pump. Two models listed with open and enclosed shaft. Capacity and head range table included. Bulletin 100, 8 p.—*Layne & Bowler Pump Co., Los Angeles. (231Q)*

Hose Assemblies

Specifies advantages of a stainless steel braided hose for handling corrosive fluids in high temperature applications. Fittings available in carbon steel, aluminum, or stainless steel. Bulletin FH-2, 4 p.—*Resistoflex Corp., Belleville, N. J. (231 R)*

Gas Dryers

Concerns packaged dehydration unit for efficient drying of air and other gases in industrial, processing and laboratory installations. Diagrams show typical setups and tables illustrate data. 8 p.—*J. F. Pritchard & Co., Kansas City. (231S)*

Variable Speed Pulleys

Operational features discussed for a series of variable speed pulleys having a unique control base, which is said to eliminate necessity for a pivoted motor mount to maintain belt tension. Formula and table aids selection. Bulletin D4551, 4 p.—*Equipment Engineering Co., Minneapolis. (231T)*

Pump Line

Condensed bulletin depicts wide line of centrifugal, reciprocating, screw, and rotary-gear pumps. Applications, capacities and features are given. 4 p.—*Warren Steam Pump Co., Inc., Warren, Mass. (231U)*

Pressure Reducing Valves

Presents new features of an orifice-type pressure regulating valve for use in steam, water, oil, gas, air and chemical installations. Available in a variety of metals from $\frac{1}{4}$ to 2 in. sizes. Bulletin J-1, 4 p.—*Jordan Corp., Cincinnati. (231V)*

Automatic Metering System

Described system consists of three principal units: control unit, valve, and standard make of meter. System is said to provide automatic metering and batching of light or heavy liquids. Bulletin FL-49, 8 p.—*Hetherington & Burner, Inc., Indianapolis. (231W)*

Heat Exchangers

Considers series of stainless steel heat exchangers for corrosive applications. Construction, dimensions, and styles are detailed. Catalog 1155, 4 p.—*Young Radiator Co., Racine, Wis. (231X)*

Globe Valve Line

Brief, illustrated catalog depicts line of stainless steel globe valves ranging in size from $\frac{1}{4}$ to 6 in. for corrosive applications. Bulletin 55A, 4 p.—*Cooper Alloy Corp. Hillside, N. J. (231Y)*

Glass-Ball Air Filter

Basic facts are given on operation of an air filter, employing a countercurrent spray and glass balls to remove dust contaminants. Collecting unit has inclined flight conveyor to rid settling tank of accumulated sludge. Bulletin 55, 10 p.—*National Dust Collector Corp., Chicago. (231Z)*

Carbon Steel Tubing

Concerns advantages, uses, and working data for a low-carbon steel tube line. Handy chart contains specifications for the different types. Bulletin 39, 6 p.—*Superior Tube Co., Morristown, Pa. (231AA)*

Water Softening Process

Presents a study of the factors influencing chemical reaction in hot and cold process water treatment units. Data given is of value to engineers designing or selecting water softening units for industrial application. Technical Reprint T-134, 10 p.—*Graver Water Conditioning Co., New York City. (231AB)*

Steam Traps

Features four, inverted bucket-type high capacity steam traps. Units are of cast semi-steel construction with stainless seats and disks and drawn brass buckets. Units are available for pressures to 250 psi. Section 601, 2 p.—*Clark Mfg. Co., Cleveland. (231AC)*

Electrical Distribution

Comprehensive catalog details and pictures wide line of panel boards, bus ways, motor control centers, switchboards, sectional distribution centers, and wire ways. Components such as safety switches, night switches, circuit breakers, and fusible service equipment are also listed. Catalog CEC-1032.—*General Electric Co., Plainville, Conn. (231AD)*

High Current Testers

Concerns instruments for testing and calibrating high current actuated protective devices. Detailed procedures for improving maintenance practice by use of a test-record system. Bulletin 555, 4 p.—*Multi-Amp Corp., Newark, N. J. (231AE)*

Eastman offers widest range of antioxidants

If your food product needs protection against rancidity, bad odor or off-flavor caused by oxidative deterioration, Eastman can help you.

Eastman is the leader in food-grade antioxidants. The leader in volume . . . in experience . . . in accumulated data.

No other manufacturer can offer such dependable counsel in the proper use of antioxidants for the stabilization of foods.

The effectiveness of Eastman recommendations and Eastman Tenox antioxidants has been proved on the following products:

Animal Fats and Oils	Cosmetics
Vitamin A	Monoglycerides
Cereals	Cookies
Butter Fat Concentrate	Essential Oils
Fish and Fish Meal	Citrus Oils
Chewing Gum	Potato Chips
Meat Products	Dog Food
Crackers	Premixes
Paper Board	Spices
Dairy Products	Wax
Chicken Fat	Candy
Vegetable Fats and Oils	Nuts

Don't let rancidity cause returns, losses and dissatisfied customers. Look into the simple remedy of antioxidants. Their cost is low.

Eastman will be glad to recommend an antioxidant treatment or even undertake a testing program for whatever food product you wish to stabilize. The recommendations you receive will represent the most effective treatment at the lowest possible cost. For Eastman offers a full range of antioxidants and has no axe to grind in favor of any one antioxidant. We make them all!

For more information about Tenox, write to Eastman Chemical Products, Inc., Kingsport, Tennessee—a subsidiary of Eastman Kodak Company.

Tenox Eastman Food-grade Antioxidants

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York — 260 Madison Ave.; Framingham, Mass. — 65 Concord St.; Cincinnati — Carew Tower; Cleveland — Terminal Tower Bldg.; Chicago — 360 N. Michigan Ave.; St. Louis — Continental Bldg.; Houston — 412 Main St. **West Coast: Wilson Meyer Co.,** San Francisco — 333 Montgomery St.; Los Angeles — 4800 District Blvd.; Portland — 520 S. W. Sixth Ave.; Salt Lake City — 73 S. Main St.; Seattle — 821 Second Ave.; **Canada: P. N. Sodon Co., Ltd.,** Montreal, Quebec — 2143 St. Patrick St.; Toronto, Ontario — 1498 Yonge St.

Fuel Oil Additives

Concerns use of an additive in heavy and light fuel oils, and diesel fuel oils to uniformly disperse sludge and thus gain added combustion efficiency. Product said to keep tanks, lines, preheaters, strainers, and burners clean and free from gummy deposits. 4 p.—*Decar Chemical Products Co., Pittsburgh. (232A)*

Can Line Counter

Facts given for installation of a remote type can and bottle line counter. Unit transmits counts to centralized panel. Conveyor component is said to be moisture-proof and highly accurate.—*Durant Mfg. Co., Milwaukee. (232B)*

Fluid Drive Coupling

Cutaway drawings show four details of a line of dry fluid-drive motor couplings. Units employ steel shot as the fluid medium. Table gives selection data. Bulletin A-640, 12 p.—*Dodge Mfg. Corp., Mishawaka, Ind. (232C)*

Alarm System

Covers action and flexibility of a compact 10-unit annunciator system, with flashing visual indicators, for use in power plant applications. Each plug-in and light box combination provides alarm indications for two separate unrelated field conditions. 4 p.—*Seam Instrument Corp., Chicago. (232D)*

MAINTENANCE

Concrete Floors

Handy manual provides capsulized information on cleaning, finishing, and daily maintenance tips for concrete floors. 12 p.—*National Sanitary Supply Assn., Chicago. (232E)*

Machine Alignment

Concerns use of an instrument for accurately aligning bed ways on lathes, grinders, milling machines, shapers, boring mills, and gear cutting machines. 4 p.—*King Instrument Co., Minneapolis. (232F)*

Battery Training Manual

Comprehensive illustrated booklet gives full facts and many handy tips for handling and storage of lead-acid batteries. Special tools are illustrated with various charging room layouts and diagrams. 42 p.—*Gould National Batteries, Inc., New York City. (232G)*

Plastic Sink Traps

Leaflet shows two-model line of polyethylene sink traps—one of which can be installed without use of tools. Units are said to be highly resistant to corrosive chemical action. 4 p.—*Arthur S. LaPine & Co., Chicago. (232H)*

Spray Gun Units

Concerns compact, portable and fixed spray gun and air compressor units. Features and component parts are illustrated. Price list included. Bulletin GO-1254, 4 p.—*L. M. Gossett Co., Wharton Grove, Ill. (232I)*

Stainless Fasteners

Diagrams and tables list wide line of stainless screws, bolts, nuts, washers, rivets, pins, and keys. 8 p.—*Allmetal Screw Products Co., Inc., Garden City, N. Y. (232J)*

Snap-Action Coupling

Detailed cross section illustrates advantages and construction of a tiny, snap-action coupling with swivel seat. It can be used to couple both hoses and instrument lines. Will stand pressure up to 150 psi. Bulletin 230, 4 p.—*Snap-Tite, Inc., Union City, Pa. (232K)*

Cement Bonding

Application information shows advantages of a bonding compound used for permanently joining plaster and cement mixtures to new and old concrete and masonry surfaces. 4 p.—*Upco Co., Cleveland. (232L)*

Bearing Line

Comprehensive catalog gives complete information on a wide line of pillow block, flange, and hangar bearings. Contains pertinent engineering data and specification table. Rear of book has conversion table of general engineering interest. Catalog 454, 64 p.—*Stephens-Adamson Mfg. Co., Aurora, Ill. (232M)*

Mechanical Seal

Considers construction features of a mechanical seal said to be completely interchangeable with stuffing-box packing in pumps and other rotary processing equipment. Use is said to increase service life under corrosive conditions. Bulletin CP 551, 4 p.—*Chemical & Power Products, Inc., New York City. (232N)*

Panel-Switch Seal

Leaflet shows a molded rubber seal, cemented to a threaded metal insert, for protection of panel-mounted toggle switches from water, dust, moisture, and gases. 1 p.—*Panseal Inc., Little Ferry, N. J. (232O)*

Snow and Ice Melter

Concerns a useful chemical for melting snow and ice, said to be especially suitable for clearing large areas. Material is available in pellet form that is adaptable for truck or mechanical hand spreaders. It can also be sprinkled or shoveled in conventional manner. Bulletin RL-427, 2 p.—*Revere Chemical Corp., Cleveland. (232P)*

Take-up Bearings

Pictures, diagrams and specification tables give full facts for a line of take-up bearings and bracket hangers. New hinged top frame provides easy access to bearing block. Bulletin 2539, 4 p.—*Link-Belt Co., Philadelphia. (233A)*

Eye Shield

Leaflet shows advantages of a new plastic eye shield said to give 180-deg. range of vision.—*Pulmosan Safety Equipment Corp., St. Louis. (233B)*

Flexible Hose

Leaflet lists selection data for a flexible hose ranging in size from 4 to 12 in., and for flexible ducting available in sizes from 3 to 18 in.—*Flexaust Co., New York City. (233C)*

Tractor-Compressor Unit

Bulletin concerns a combination air compressor and tractor. Specification table gives pertinent facts. Bulletin T3, 8 p.—*Westinghouse Air Brake Co., LeRoi Div., Milwaukee. (233D)*

Floor Reconditioner

States advantages and applications of a series of compounds used to revitalize old wood and cement floors. Form 1025, 20 p.—*Monroe Co., Inc., Cleveland. (233E)*

MATERIALS HANDLING

Truck Leasing Plans

Consists of a pro-and-con discussion of leasing plans for industrial fork trucks. Sums up basic advantages and disadvantages of the system. Form B-529-511154, 4 p.—*Elwell-Parker Electric Co., Cleveland. (233F)*

Overhead Trolleys

Bulletin illustrates design and component construction of an overhead roller-trolley conveyor. Various attachments and accessories are detailed. Form RK-55, 4 p.—*Rapistan-Keystone, Inc., Detroit. (233G)*

Traveling Electric Hoists

Cutaway drawing shows features of an electric cable hoist. Unit is roller equipped to travel on an I-beam, and contains grooved drum to reduce cable wear. Bulletin H-37, 4 p.—*Harnischfeger Corp., Milwaukee. (233H)*

Roller Track Component

Leaflet shows gravity wheel conveyor strip which can be used in various combinations to create a flexible conveyor network. Units are available in 10-ft. lengths with 1¼ in. or 2 in. diameter wheels. Form FT-55, 2 p.—*Rapids-Standard Co., Inc., Grand Rapids, Mich. (233I)*

Single-Mast Fork Truck

Operating advantages of a single-mast lift truck, said to provide greater visibility, are detailed. Unit comes in 3,000 and 4,000 lb.-capacity models. Load lifting speed is rated at 58-ft./min. Form 1402, 6 p.—*Hyster Co., Portland, Ore. (233J)*

Steel-Mesh Belt Sprockets

Chart lists sprocket data for a line of steel-mesh conveyor belts. 6 p.—*LaPorte Mat & Mfg. Co., LaPorte, Ind. (233K)*

LP-Gas Power

Considers advantages in use of LP-gas for lift truck power. Photos show close-up of engine installation. 4 p.—*Towmotor Corp., Cleveland. (233L)*

Pallet Rollers

Pictures and specifies line of pallet-rolling dollies, constructed of heavy-gage channel steel with bearing-equipped rollers. Center rollers set higher than end rollers to facilitate swiveling action. 2 p.—*Penco Engineering Co., San Francisco. (233M)*

Semi-Automatic Palletizer

Bulletin details operation of semi-automatic, one-man case palletizer. Capacity chart gives case speed obtainable when plotted against cases-per-tier on pallet. Bulletin 55-9, 6 p.—*J. W. Greer Co., Wilmington, Mass. (233N)*

Fork Truck Applications

Folder shows variety of fork truck equipment in many applications. Gives many tips for solution of materials handling problems and increased storage capacity. 75 p.—*Lewis-Shepard Products, Inc., Watertown, Mass. (233O)*

Lift Truck Selection

Folder explains method and supplies chart for rating lift trucks according to the user's needs. A price-per-point rating score helps select the right lift for the job. Forms 1406 and 1411, 4 p.—*Hyster Co., Portland, Ore. (233P)*

Electric Mule

Treats of compact electric-powered towing mule for pulling strings of warehouse carts. Full operational features and advantages are given. 4 p. *Clark Equipment Co., Battle Creek, Mich. (233Q)*

Roller Conveyor Line

Literature depicts line of solid ball bearing roller conveyors and components. Units available in many sizes and diameters. Necessary curves, spurs, and hinged sections are detailed. Catalog 60A, 20 p.—*E. W. Buschman Co., Cincinnati. (233R)*

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Filter Aid

Brochure explains how diatomite filter aid products remove colloids and other suspended impurities. Illustrates adaptability of the powder to various types of filter design. 12 p.—*Johns-Manville, New York City. (234A)*

Horizontal Filter

Unique features of horizontal filter pictured. Unit opens under hydraulic pressure. Leaves lift out and in without bolt fastening. Vibrating attachment optional for shaking off filter cake. Bulletin NH-155, 4 p.—*Industrial Filter & Pump Mfg. Co., Chicago. (234B)*

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Panel Screens

Contains descriptive material on a panel-type screen formed from wedge-shaped wires, said to increase screening ability and reduce clogging. Available in a variety of metals. 12 p.—*Hendrick Mfg. Co., Carbondale, Pa. (234C)*

Dry Material Feeder

Description, operation, and uses of a compact, dry material disk feeder are covered. Large hopper affords convenient filling. Illuminated feeding compartment gives greater visibility. Bulletin 50-K7A, 2 p.—*Omega Machine Co., Providence, R. I. (234D)*

Oil Separator

Bulletin makes extensive use of cutaway drawings to illustrate operation of a jet-nozzle-type oil separator useful in fish, olive, palm, and butter oil clarifying operations. Bulletin 2117, 8 p.—*Centrico, Inc., Englewood, N. J. (234E)*

Cane Juice Clarifier

Covers characteristics, dimensions, and operating advantages of a new type, high-speed cane juice clarifier. Capacities and dimensions are provided in a single table for this gravity flow unit. Bulletin 402, 4 p.—*Dorr-Oliver Corp., Stamford, Conn. (234F)*

Filter Line

Free illustrated bulletin gives facts on a line of drum, disk, and laboratory filters. Unit operation is discussed and complete data given. Bulletin FG-B1, 16 p.—*Denver Equipment Co., Denver. (234G)*

Rotary Fillers

Specifications are tabulated for a 3-model line of rotary stainless steel fillers. Units are designed to handle glass containers at speeds up to 250 per min. Models range from 18 to 30 heads. Bulletin 130, 6 p.—*Pneumatic Scale Corp., Ltd., Quincy, Mass. (234H)*

INSTRUMENTS

Photoelectric Control

Comprehensive booklet covers wide line of photoelectric equipment and gives graphic examples of their use for different control situations. Bulletin PA 555, 20 p.—*Electronics Corp. of America, Cambridge, Mass. 234I)*

Millivolt Meter Principles

Educational bulletin gives technical data, operational diagrams, schematic drawings and general information on millivolt meter construction and application to control instruments. Handy tips are given for selection of proper type control system to meet process requirements. Bulletin 9, 16 p. —*Barber-Coleman Co., Rockford, Ill. (234J)*

Sequence Timing Control

Describes two systems for automatic operation of chemical feeders and other equipment by measurement of total flow or weight factors. Data Sheets 11 and 12-1, 4 p.—*Min apolis-Honeywell Regulator Co., Philadelphia. (234K)*

Automatic Valve Line

Covers extensive line of magnetic, hydramotor, and proportioning valves. Full specifications given with prices. Catalog 1955, 46 p.—*General Controls, Burbank, Calif. (234L)*

Tachometer Uses

Bulletin suggests wide range of uses for industrial-type stationary, centrifugal tachometers. Drawings illustrate interchangeable components. 4 p.—*Boulin Instrument Corp., New York City. (234M)*

Pressure Gage Snubber

Facts presented on use of pressure gage snubber to damp sudden changes in line pressure that damage gages. Unit reduces needle vibration too. Catalog File 1191A11, 2 p.—*Parker Appliance Co., Cleveland. (234N)*

Controller Catalog

Details specifications and presents photos of a wide line of temperature recorders, indicators,

recording controllers, alarms, and compensators. Bulb installations are shown in pipes, driers, ducts, kettles, and vats. Catalog 12-A-10, 24 p.—*Fischer & Porter Co., Hatboro, Pa. (234O)*

Electronic Flowmeters

Details line of electronic transmitters for measurement of differential pressures, liquid levels, temperatures, and pressures. Also used to indicate fluid, gas, air, and steam flows. Combination of flows or flow and level indications can be recorded on same chart. Publication 55-1074-222, 12 p.—*Hayes Corp., Michigan City, Ind. (235A)*

Continuous Weighing

Brochure diagrams method for continuous weighing of belt-transported solids. Component parts are covered and installation and application data given.—*Trans-Weigh Co., Wayne, Pa. (235B)*

Compact Thermostat

Considers operational features of a compact thermostat with stainless steel sensing element. Unit has range of 35 to 600 F. It is said to be capable of controlling temperatures to within ½ F. (liquids). Bulletin 120, 2 p.—*Burling Instrument Co., Chatham, N. J. (235C)*

TRANSPORTATION

Dry-Ice Coolers

Specifications and pictures tell story of dry ice reefer coolers with thermostatic control. Installation tips given. 16 p.—*Foster-Built Bunkers, Inc., Chicago. (235D)*

Refrigeration System

Leaflets illustrate models of gas-electric refrigeration systems. Booklet lists country-wide, approved stations where service work is available.—*U. S. Thermo Control Co., Minneapolis. (235E)*

Truck Refrigeration

Four brochures illustrate single- and two-compressor truck refrigeration systems, and shows piping arrangement for hold-over, plate-type equipment. Units are designed for all needs. 4 p.—*Lehigh Mfg. Co., Lancaster, Pa. (235F)*

Impact Instrument

For installation in trucks or freight cars, described instrument is used to gain impact data and determine forces injurious to goods in shipment. 4 p.—*Impact-O-Graph Corp., Cleveland. (235G)*

Packaged Refrigeration Unit

Considers advantages of a compact, packaged electrical refrigeration system for round-the-clock truck cooling. Unit mounts inside body. Bulletin GEA-6084A, 8 p.—*General Electric Co., Schenectady, N. Y. (235H)*

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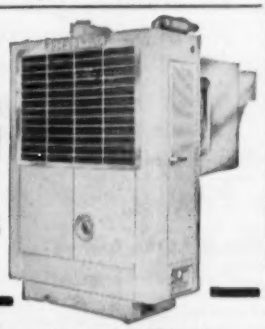

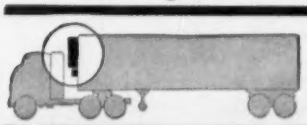

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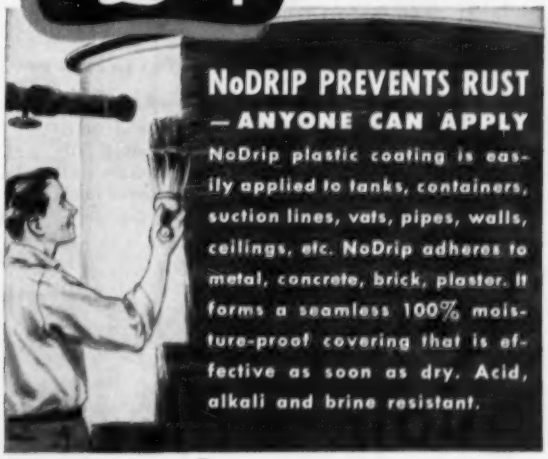

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Company has been in existence since 1870, and has "know-how" as regards making high-quality foods.

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BO-7666, Food Engineering
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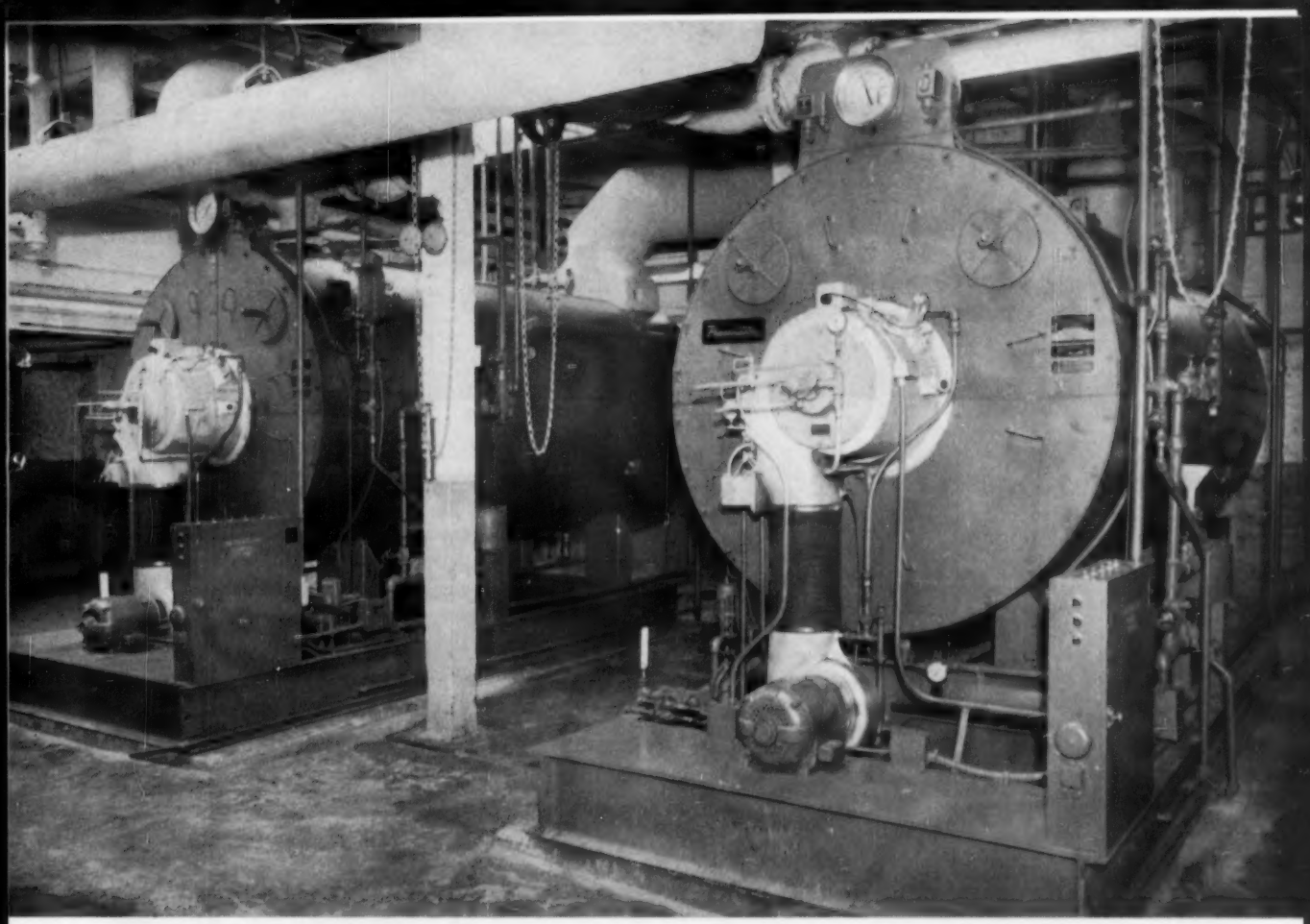

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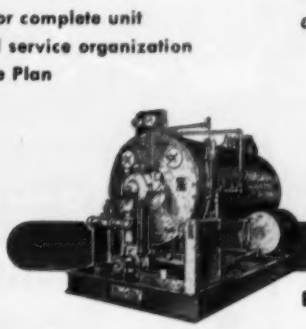

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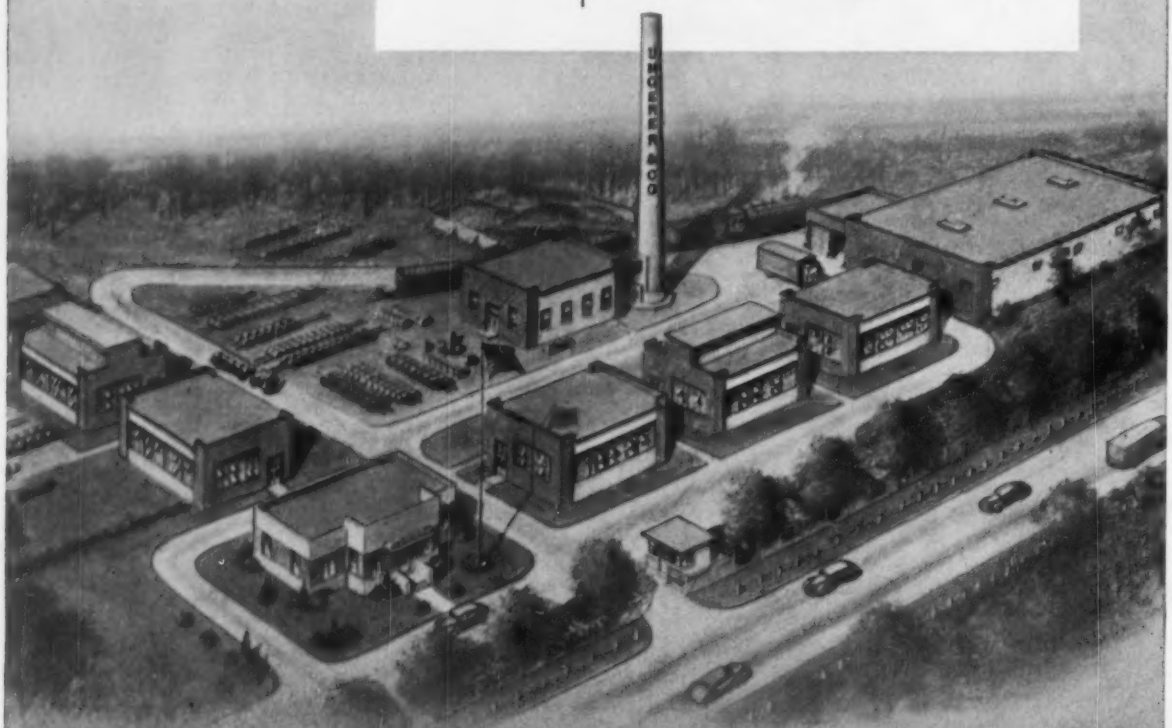

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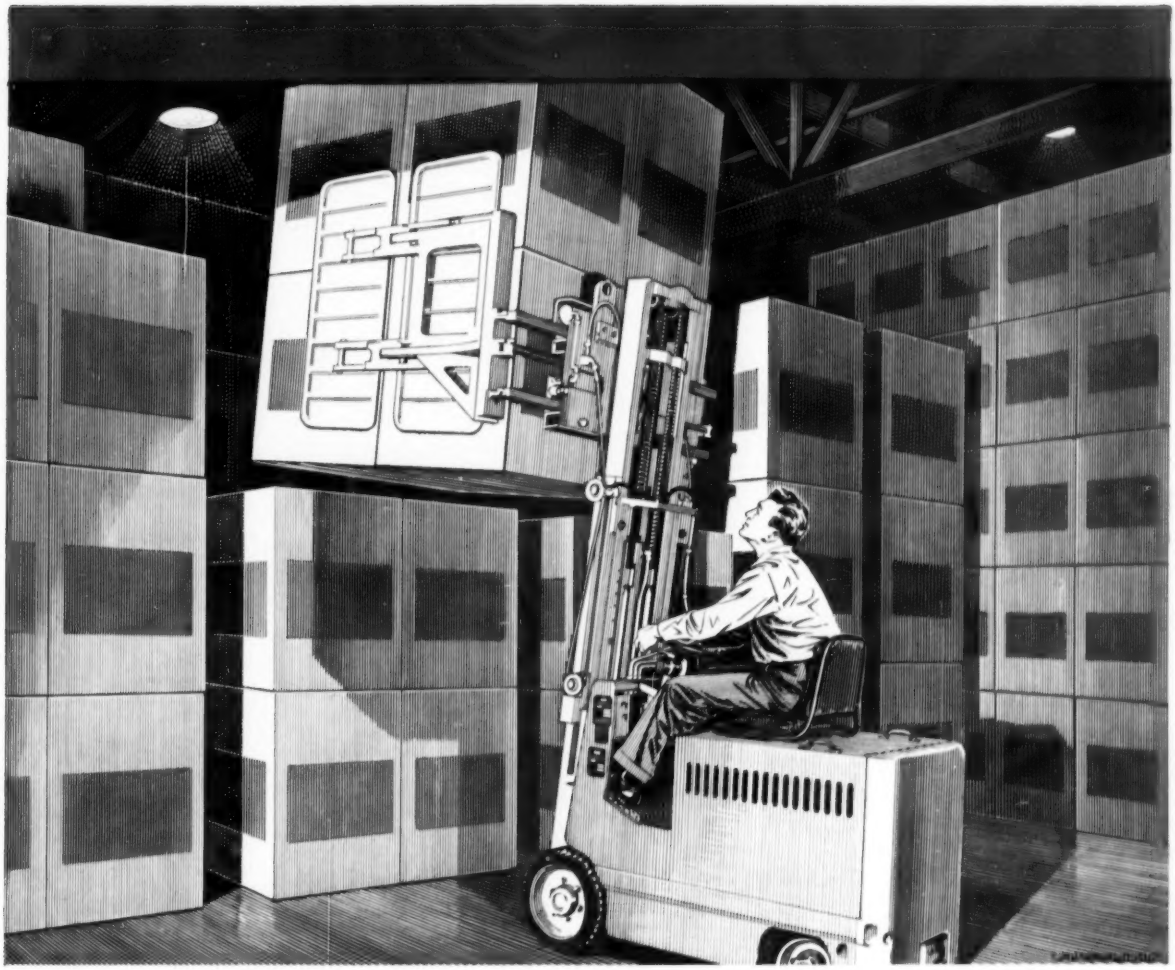

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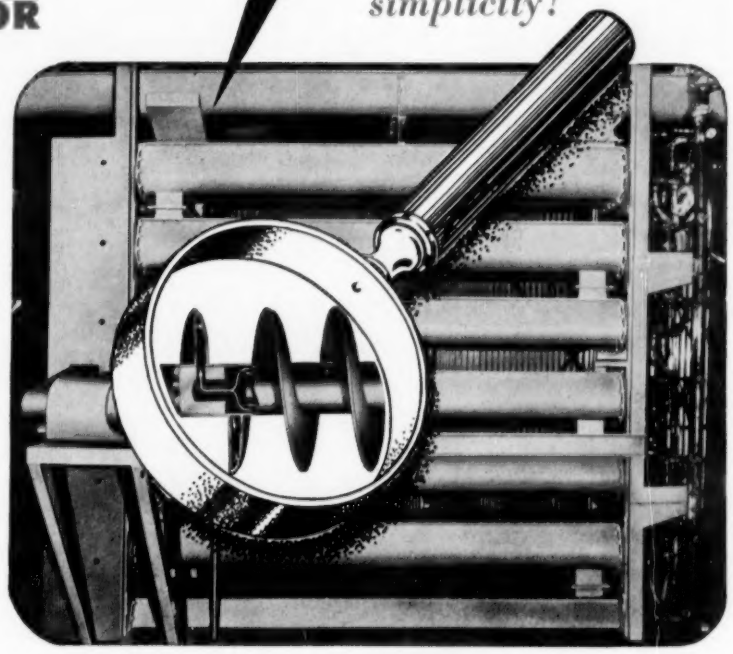

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The HOLO-FLITE Saves Space—It requires as little as 1/5th the space of other units of comparable capacity because (1) it has far greater heat-transfer area per cubic foot of space . . . and (2) the flights can be "tiered" as high as desired to give maximum capacity in very small floor areas.

The HOLO-FLITE is Versatile—Processed product can be fluid, pulp or paste—granular, crystalline or powdered solid. Heat-transfer fluid can be refrigerant, cooled or ambient water, steam, oil or any other desired fluid, at any normal temperature range.

The HOLO-FLITE Is Dust-Free—Its gentle action provides large heat-transfer action without dust and with negligible particle abrasion. Simplifies installations, assures higher quality product.

The HOLO-FLITE Is Adaptable—It can easily be designed to handle virtually any capacity by (a) varying the diameter of the screws (7" to 16") . . . (b) varying the length of the screws (8 ft. to 20 ft.) . . . (c) varying the number of intermeshing screws per trough (2, 4, or 6) . . . and (d) varying the number of tiers stacked on top of one another (1 to 10, or more).

WESTERN Precipitation CORPORATION

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The HOLO-FLITE is in daily operation on such typical products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods and many other equally-varied products.

What is your problem? *Our engineers will be glad to assist you in making the most of* HOLO-FLITE *advantages. Write wire, or phone the office nearest you!*

Want More Facts? This 8 page booklet describing the HOLO-FLITE in greater detail will gladly be sent on request. No obligation, of course.